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SOME PROBLEMS RAISED BY THE REPORT OF THE ROYAL COMMISSION ON THE TAXATION OF PROFITS AND INCOME[1]

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The Report of the Royal Commission on Taxation will provide food for thought and fuel for controversy for a long time to come. Although its recommendations are not revolutionary, the arguments by which they are arrived at are carefully developed. Some of the more imaginative proposals—in so far as they are within the terms of reference—are considered, discussed, and occasionally rather regretfully rejected.

In the following I shall attempt to single out a few of the numerous problems raised by the Report. I have made use of the published evidence in an attempt to discover what views on certain topics are held outside the academic community, and I shall discuss some of these, even although they have no direct bearing on the recommendations of the Commission. But I have also attempted to relate the evidence to the Report, and to appraise some of the recommendations independently.

The topics discussed are the following:

I. Taxation and Prices. II. The Valuation of Fixed Assets and Stocks, and the Computation of Profits. III. Initial and Investment Allowances. IV. Taxation and the Size of Firms. V. Overseas Profits. VI. Incentives. VII. Equity *versus* Policy.

I. TAXATION AND PRICES

The Commission returned desultorily to the much-debated question that had haunted the Colwyn Committee: can an income tax which is a tax on profits be passed on to the buyer in the form of higher prices? The

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[1] The following abbreviations will be used throughout this article:

R.C.	Royal Commission on the Taxation of Profits and Income. Cmd. 9474. Final Report. The figures refer to paragraphs in the report.
M.D.	Memorandum of Dissent by Mr. G. Woodcock, Mr. H. L. Bullock and Mr. N. Kaldor; *ibid.* Figures refer to paragraphs.
Day 4, 801	Minutes of Evidence taken before the Royal Commission. The number after the day refers to the question.
A.B.C.C.	Association of British Chambers of Commerce.
B.B.A.	British Bankers' Association.
F.B.I.	Federation of British Industries.
N.U.M.	National Union of Manufacturers.
T.U.C.	Trades Union Congress.

business world assert as confidently as ever that it can and that it is,[1] whilst the denial of the economists has been surrounded by numerous qualifications since the days of Sir Josiah Stamp, Seligman, and Professor Pigou. The classical treatment is to be found in Professor Seligman's 'Income Tax and the Price Level', reprinted as Appendix XII to the Report of the Colwyn Committee. Professor Pigou in his evidence before the Colwyn Committee said: 'If, as may be presumed, people are already charging the prices that yield them the best profit, the removal by the State of a proportion of the profit will not tempt them to fix prices differently.'

Yet the Minority say (expressing in this the general opinion of the Commissioners) that 'no conclusive evidence was before us that would enable us to say whether or not the incidence of taxes on company profits is shifted in the form of higher prices.' (M.D. 95.)

As early as 1927 Professor Robertson refuted the Seligman doctrine, using Marshall's analysis on which Seligman also claimed to base his views.[2] Only if profits are a pure surplus would a tax on profits not affect output. But it is generally admitted that they are often a cost, either of risk-taking or of managerial effort. If the supply of enterprise is at all elastic (either in the short period or in the long period) a tax will affect output. Unless costs are constant, it will therefore affect price. The argument can easily be extended to undistributed profits. There may also be effects on price *via* changes in liquidity, riskiness, the supply of capital, etc. There is no point in dwelling on the distinction between 'incidence' and 'effects' so dear to the Colwyn Committee. Whether the time sequence is rise in price, fall in the quantity demanded, fall in the quantity supplied, or whether it is fall in the quantity supplied, rise in price, fall in the quantity demanded, makes no difference to the equilibrium attained if we remember the mutual determination of economic variables.[3]

Mr. S. P. Chambers' evidence (for the F.B.I.) is interesting in this connection. He denied that a tax on profits can be passed on (Day 4, 800; although he then asserted, inconsistently, that a profits tax may force a company which has pursued a reasonable price policy to raise prices; 806) but that it has an important indirect effect by reducing productivity.[4] The assumption underlying the argument of many business witnesses appears to be that the elasticity of supply of management and enterprise is low in the short period, but high in the long period. People who are accustomed to manager and administer will go on, even for greatly reduced rewards. But the next generation will prefer leisure. High taxation—the argument runs—reduces in the long period both the amount and the intensity of the effort of management and enterprise, reduces supply, and thus raises prices.[5]

As far as the effect on productivity is concerned, it is a question of incentives and need not detain us here. Assuming a tax reduces supply, the effect on prices depends on how costs vary with output and what monetary policy is pursued.

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[1] *E.g.* Day 9, 2460. Issuing Houses Association, Day 4, 800, 806, F.B.I., Day 5, Memorandum submitted by the A.B.C.C. para. 7, and 1214–1239.

[2] 'Income Tax and the Price Level', *Economic Fragments.*

[3] D. H. Robertson, *op. cit.*, p. 33.

[4] Also Mr. Bower for the A.B.C.C., Day 5, 1097. 'Taxation checks (productivity) all along the line.'

[5] Day 15, 3898, 4058; Day 4, 801.

A related controversy, familiar from the Colwyn Committee, turned up again. If a tax can be passed on to consumers, the argument runs, it ceases to be a burden on the business man. So why all the wailing ? On classical assumptions this is clearly false : although profit per unit may be the same after a tax is passed on, the number of units sold will decline, and with it total profits. Although this is an argument from partial equilibrium analysis, it retains some validity in general equilibrium analysis : prices may rise because leisure is increased in relation to production, or because more firms produce at higher costs the same output, etc.

When asked by Mr. Crick why he objected to taxation if he passes it on to the buyer, Mr. Bower (for the A.B.C.C.) replied : ' Because not everybody can do it.' (Day 5, 1202). But, disregarding inflation for the moment, his case is surely stronger. Even if tax is passed on, the volume of sales will drop and though profits margins are raised initially, profits will fall ultimately.

There is a spirited encounter on the same topic between Mr. Kaldor and Mr. Bower (Day 5, 1214–1239). The interrogator attempts to refute the statement of the witness that a tax is passed on, by submitting (*a*) that the only way in which it could have been passed on is a rise in profit margins, and (*b*) that profit margins in fact had not risen. Although Mr. Bower appears puzzled and bewildered, there are at least two arguments that make constant ex-post profit margins consistent with the passing on of tax.

First, higher taxes may lead to reduced output, hence higher costs and higher prices with margins constant; or again, even if the first step is a rise in prices and profit margins (instead of a fall in output) this will reduce the quantity demanded, will raise costs and result in eventually unaltered profit margins.

Second, business men said repeatedly that in periods of inflation like the post-war period, profit margins fall : cost increases are not entirely passed on. For one reason or another profits are not maximised in the short run. But if a tax is imposed the restraint is reduced or removed, and prices are raised to their optimum level. Again, unchanged profit margins are compatible with the passing on of the tax.

Turning to the question of the relation between tax and prices, business men advanced four types of conditions which call for a revision of the Marshallian assumptions : inflation and the effect of current price on future price, oligopoly, and monopoly : In addition to these, a tax may affect prices *via* the supply of capital.

(i) *Inflation.* In section 7 of the Memorandum of the Association of British Chambers of Commerce (Day 5) we read :

> ' It has been the common experience that in a time when demand is greater than supply, the supplier, whether of goods or of labour, has

> been able to increase his price in an effort to retain nearly the same net reward after tax as he had before the tax was levied or increased.'[1]

At first blush, Professor Seligman's observations in 1924 would seem to the point:

> ' There is only one possible weakness in the above analysis. In a period of rapidly rising prices, we may have what is commonly called a sellers' market. Everyone is then anxious to buy; every producer is turning out goods at the maximum rate, and stocks are being depleted almost more rapidly than they can be replenished. . . Under such circumstances, indeed, the imposition of a tax of any kind, whether on income or anything else, will afford the producer an excuse for asking a still higher price, and the conditions of the market may enable him to hold to that price. But after all, the tax will then be an excuse for, rather than a cause of, the higher price which he would probably have been led to demand in any event.'

This is the nearest Seligman came to analysing the type of conditions which are familiar from post-war Britain. The situation under consideration seems to be this: before tax, demand exceeds supply, and profits are forgone; after tax, price is raised towards the equilibrium level in order to maintain profits. The analysis of this situation turns on the question whether (*a*) the sacrifice of profits before tax is rational, and (*b*) whether the imposition of the tax has altered the variables relevant to profit maximisation.

The easy way out is simply to say that firms do not attempt to maximise profits, but merely to make ' fair ' profits. This would give the required results. But in the light of recent revisitations, it is possible to square this type of behaviour with the assumption of maximisation. The low price policy was pursued in order to secure larger future profits by sacrificing current profits. Implicit in this assumption is that long delivery dates do not destroy goodwill as much as high short-run equilibrium prices, and that the inflation will not last. A tax on profits, by reducing liquid reserves and by making the firm more dependent on outside borrowing, increases risks and shifts the subjective weights attached by the entrepreneur in favour of current and against future profits. When risks are small, he sacrifices current for future profits willingly, but not when they are great. In Professor Hicks's terms, the tax converts the firm from a 'sticker' in the direction of 'snatching'.[2] If this analysis is accepted, a tax would raise prices. Mr. F. Bower's evidence (for the A.B.C.C.) lends force to the premise of this interpretation. 'A business man . . . just does not charge the maximum price of the market. He values his connection rather than his to-day's profit . . . ' (Day 5, 1431.)

Professor Hicks suggested to Mr. Bower another possible mechanism (1206). If prices are controlled by regulation, the prices that business presses for may be affected by taxes on profits. But this is strongly denied by Mr.

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[1] See also: Memorandum of the Society of Incorporated Accountants and Auditors, Day 16, Sec. 17 and question 4406.

[2] J. R. Hicks: 'The Process of Imperfect Competition', *Oxford Economic Papers*, February, 1954.

Bower (1207). Taxes, he asserts, would not be regarded as appropriate costs to be considered in this connection.

(ii) *Oligopoly*. The most important reason, according to business witnesses, why prices are not raised to their optimum level is the fear of reprisals. Mr. Bower says: 'A business man does not charge the highest possible price (*a*) because somebody might be round the corner to undercut him and he would lose valuable custom and (*b*) . . . ' (then follows the long-run effect on goodwill quoted above). (*a*) might provide another rationalisation of the passing on of tax. Before tax, price rise is unprofitable because the firm is faced with an elastic individual demand curve. After tax, it assumes that others will also raise their prices, and it can thus move up on the inelastic industry demand curve. In other words, the tax liability is interpreted by the oligopolists as an invitation to collusive exploitation of the inelastic industry demand.

As motives are mixed, the combination of inflationary conditions, in which price is held down because of its effect on goodwill, and oligopolistic conditions, in which it is held down because of fears that others will not follow, may reinforce each other: the goodwill factor removes oligopolistic fears, and the absence of oligopolistic fears strengthens the goodwill factor. Oligopolistic collusion to raise prices is thus strengthened by the general shift on the snatcher-sticker spectrum towards the snatcher end.

(iii) *Monopoly*. It is repeatedly argued that only the monopolist is in a position to pass on tax in higher prices (*e.g.* Day 4, 800, Day 15, 3936, Day 16, 4222–4224, 4406). Now clearly if he is a textbook monopolist and the tax falls on pure monopoly profits he is less able to pass on tax than a competitive firm whose normal profits are costs. But we are, of course, not faced with textbook monopolists. In so far as they are not oligopolists they are firms which, for one reason or another, are not charging optimum prices before the tax is imposed. It may be that they fear new entries, government action, wage demands, dividend demands, unfavourable public opinion, etc. The reduction of their profits through tax weakens the reluctance to exploit fully their monopoly position and thus leads to price increases. This is the impression one gets, *e.g.*, from Mr. Chambers (Day 4, 806)—curiously, shortly after he has asserted that an income tax on profits cannot be passed on (800). It seems that the correct way to look at the relation between tax and prices is to view it in the light of the removal of obstacles to short-run profit maximization.

(iv) *The supply of capital*. It is possible to object to the above arguments on the ground that they constitute an illegitimate extension of partial equilibrium analysis to the economy as a whole. Demand for one product may be reduced through higher prices, but not demand for all products. But even for the economy as a whole, it may be the case that production is reduced in relation to leisure, or that it has become more monopolistic, a larger number of firms producing at higher prime costs, or that prime costs have risen in those sectors which are in a position to raise prices and thus pass on the tax.

But even if it is true that tax does not reduced output at all in the short run, there is another way by which the taxation of business profits would tend to get passed on to consumers.[1] In so far as it leads to a reduction in the *proportion* of profits distributed, it involves a lower market valuation of shares, not only proportional to the reduction in earnings due to tax, but by more than that proportion.[2] Hence the valuation of shares falls in relation to the real value of assets and the earning power of firms. This makes it more difficult for new and rapidly expanding firms to recruit new equity capital, since the rate of profit expected on the new shares must be comparable to the earnings yield of equivalent existing shares. Thus, although the effect of taxation in the short run will be to depress the market value of shares relatively to the capital employed, in the long run it will raise the rate of profit earned on capital, by restricting competition from new and rapidly expanding firms.

Mr. Kaldor also argues that there is a second more direct influence with a similar effect on the rate of profit. A rise in the earnings yields of shares has a similar effect on the decisions of directors relating to internally financed investment to a rise in interest rates : it will be restrictive.

For both the above reasons profit margins may be expected to rise in the long run to the higher level of yield ratios of shares. In so far as tax is passed on through higher profit margins (rather than in the manner discussed in previous sections) it cannot be held responsible for such evils as the reduction of savings, investment, risk-taking, etc.

But in so far as the tax reduces competition from new and rapidly growing firms (by making it more difficult for these to recruit money), it may raise prices not so much *via* higher profit margins, as *via* reduced incentives to efficiency and thus higher costs.[3] On this argument, the tax enables inefficient and relatively stagnant firms to remain in business, while depriving new and dynamic firms of the power to reduce costs, and to innovate. In that case, deterrent incentives are compatible with passing on.

II. THE VALUATION OF FIXED ASSETS AND STOCKS, AND THE COMPUTATION OF PROFITS

General Remarks on the Valuation of Fixed Assets and Stocks

The valuation of fixed assets and stocks for the purpose of computing taxable profits was one of the most discussed and most controversial topics. Before reviewing in detail the arguments presented, some general points may be in place.

(1) One interesting fact that emerged in the evidence is the degree to which business men profess to be influenced in their decisions by accounting practices. Although it must be obvious that these practices are conventional, and to some extent arbitrary, they appear to determine :

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[1] This is Mr. Kaldor's argument. *Cf.* ' The Economic Effects of Company Taxation.' *Manchester Statistical Society.*

[2] *Loc. cit.*, p. 22.

[3] F. W. Paish, ' Company Profits and their Distribution since the War, *District Bank Review*, June 1955, pp. 25, 26.

1. price policy; this is familiar from full cost and normal cost theories;
2. dividend policy; accounting profits (net) are claimed to be the guide, and the amount of provisions and reserves irrelevant;
3. investment policy; both new investment and re-investment (whether physical or value replacement) appear to depend on what the accountants call net profits, though each in a different manner;
4. the demand and supply of new capital; earning ratios are—within limits—determined by the accountants; they, together with dividends, determine the prices of old securities, and these the conditions on which new ones can be issued;
5. more indirectly, wage demands and consumption *via* Stock Exchange values.

From many of the arguments it would appear that the accountants are responsible for some of the most important events in our economic life.[1]

(2) The evidence provides practical confirmation, on the one hand, of the crumbling of the concept of ' net income ' in dynamic conditions, and on the other, of the importance which business men attach to it in their decision-making. Professor Hicks nibbled at it on what he called ' exceedingly academic grounds ' in *Value and Capital* (p. 177), but he has now, under the pressure of taxation, been joined by more practically inspired nibblers. Professor Hicks distinguished between three definitions of income: income is the maximum amount that can be spent now while:

1. the value of capital in terms of money is expected to be maintained intact;
2. the same amount in terms of money is expected to be available for spending in the following periods ;
3. the same amount in *real terms* is expected to be available for spending in the following periods.

But the definition under consideration here is :

4. the maximum amount which can be spent now while the value of *capital* in *real terms* is expected to be maintained intact.[2]

What many witnesses proclaimed as ' true ', ' real ', or ' honest ' income was income according to definition 4. But at the same time, the business world does not object to switching its definitions, when convenient for tax purposes. They propose, *e.g.*, ' historical cost or market, whichever is lower ', for stock valuation in the balance sheet (where stock additions appear as a deduction from current costs) or ' historical or replacement, whichever is higher ', for the calculation of costs.

To judge from the evidence which was brought forward it appears that, whatever theory may say, business men attach an almost metaphysical importance to the definition of ' net income ', which seems to determine the division between their *willingness to invest* and their *willingness to replace* (where replacement may mean physical substitution or re-investment in different equipment). These appear to be two separate functions, not always positively correlated with each other, whose shape depends upon the definition of ' net income '.[1] The insistence on particular definitions conceal the insistence on ethical and political judgments.

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[1] See, for a more thorough treatment of these problems, the illuminating article by W. Froehlich, ' Income Determination and Investment ', *American Economic Review*, March 1948.

[2] The definition given by the Commission is ' income is defined as the surplus that is available to be disposed of without impairing the maintenance of real wealth '. (R.C. p. 140 para 456.)

(3) In spite of widespread opinion to the contrary, it should be obvious that the definition of income for tax purposes has no bearing on ' acknowledging reality ', ' seeking a true definition ', ' facing the facts of life,' etc., but is a matter of policy, thinly dressed up as a matter of logic. It must spring from a decision to act, not an observation of truth. If one wants to encourage investment, one can adopt Irving Fisher's definition of ' income ' as consumption only. It could provide a suitable basis for the Hobbes-Fisher-Kaldor expenditure tax, if one were seeking a nominalistic argument in support. Definition 1 can form part of an anti-cyclical taxation policy, whereas definition 4 can be used to encourage re-investment in times of inflation. A steeply progressive tax system could be defended without any utilitarian trimmings by an extension of the income concept from capital to labour, by giving tax-free human subsistence and depreciation allowances.

(4) It would appear obvious that for the purposes of this discussion the Commission must abandon the general premise (para. 23) that there will be no marked change in the value of money. But there is a curious sentence in para. 23 which makes one doubt it :

> ' Indeed, if we had thought that we were obliged to assume a persistent decline in the purchasing power of money, even if only a slow one, our examination of the problem of dealing with the inflationary element in profits which are computed without allowance for the decline would have started on a different basis and might have reached a different conclusion.'

One can only make sense of this by assuming that the whole discussion of assets and stocks is conducted on the assumption that the value of money varies only cyclically, not secularly. Yet many of the conclusions would hold in either case, and there are some which, if invalid, are invalid for both.

The Valuation of Fixed Assets

Introductory. The question at issue is this : should replacement cost[2] or historical cost be the basis of calculating depreciation allowances which are deductible from gross profits in order to arrive at taxable profits? No problem would arise if replacement were a continuous process, and if the cost of the assets to be replaced rises in the same proportion as the prices of the products sold. In fact, there is both discontinuity (even where price rises are proportional) and there are disproportionate price rises (even though there might be continuity). Either, and the combination of both, create the problem of the ' correct ' valuation.

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[1] Thus a higher rate of interest may discourage net investment, but encourage replacement investment on definitions 1 and 4 of ' net income '. More replacement is required in order to keep capital intact. *Cf.* J. R. Hicks, *Value and Capital*, pp. 185–188.

[2] The loose use of the term ' replacement cost ' may comprise a variety of different schemes. It may be either a scheme to secure that the owner of a fixed asset should be allowed to accumulate the full replacement fund tax free (replacement allowance scheme in the narrow sense), or a scheme which allows the annual sum set aside in any year for depreciation to be measured by the *current* replacement value of the asset—according to some index number. This latter, more limited, plan is called ' revalorisation ', and can take different forms.

The confusion of issues is illustrated by the paradoxical situation of laments over the erosion of capital and the precarious financial structure of businesses, in the midst of take-over bids : one might say—and business men do say to a man—that, as a result of inflation, their earnings are insufficient to replace their fixed assets at inflated costs; but one might also say that, as a result of inflation, a company's real assets are worth much more than the balance sheet shows.

The proponents of the replacement view are the representatives of industry, supported by some economists and some accountants. Its opponents the Trade Union Congress, the Fabian witnesses, and other economists and accountants. In spite of very strong support for the view, the Commission does not accept it. The arguments will be discussed under the following headings : (i) Erosion of capital; (ii) equity; (iii) revaluation of liabilities; (iv) undesirable discrimination; (v) inflationary effects; (vi) incentives.

(i) *The erosion of capital.* The first line of attack is that the present tax system prevents industry from maintaining its capital equipment intact. This argument need not detain us long. All the evidence points to the fact that capital equipment has not been eroded. Professor Paish's calculations show that total allowances (depreciation, initial and investment) amounted to £2,965m. in the years 1948–1954, and depreciation at replacement cost to £2,740m., over the same period. The detailed table is reproduced below.

	Companies' Depreciation (£ mill.)						
	1948	*1949*	*1950*	*1951*	*1952*	*1953*	*1954*
Depreciation allowed for tax ...	207	220	241	253	273	313	363
Initial and Investment allowances	95	184	232	236	109	97	142
Total allowed for tax	302	404	473	489	382	410	505
Estimated depreciation at replacement cost	280	300	330	390	450	480	510
Annual allowance as percentage of depreciation at replacement cost	*74*	*73*	*73*	*65*	*61*	*65*	*71*

F. W. Paish 'Company Profits and their distribution since the War,' *District Bank Review,* June 1955.

But even if it could be shown that total allowances were insufficient to cover replacement requirements, the case for tax relief would not have been made out. A company could use taxed profits for the purposes of replacement or it could go outside and borrow money. The Commission point this out (R.C. 341) and say that no basic right of the equity shareholder is infringed if less profit is distributed because more must be retained for the more expensive requirements of future business.[1]

Even to the extent to which there may have been something, at certain times in post-war Britain, in this view of capital erosion, this would not prove the thesis that taxation is responsible. If there was lack of maintenance, it was probably due to physical shortages rather than lack of funds. The remedy would have lain in reducing consumption or government expenditure, not in higher depreciation allowances.

What sometimes purports to be an alternative version of this argument is that capital equipment has not increased fast enough as a result of taxing what should have been depreciation allowances. But this is clearly an entirely separate argument against high taxation of profits, not a specific argument for exempting depreciation allowances calculated on replacement costs. The latter reform might well have to be accompanied by a higher rate of tax on the narrower basis of 'correctly defined' profits so that total receipts would be unaltered. Such a reform would meet the replacement cost view but not the view that tax on profits generally is too high.

The request for tax relief must therefore be based on other grounds than erosion. But as soon as it is admitted—as indeed it must be—that there are no reasons to fear erosion, the question arises whether this particular type of relief is the best, even if the general case is made out on grounds of incentive, equity, anti-inflationary policy, etc.

(ii) *Equity*. The charge that the present system is inequitable takes two forms. According to one it discriminates unfairly between different groups of shareholders. At the moment I am concerned only with its second form; that it discriminates unfairly against shareholders as a class.

Although it is recognised that the fall in the value of money in times of inflation hurts many others besides the owners of fixed assets (*e.g.* pensioners, owners of gilt-edged and creditors generally, as well as taxpayers who can claim an allowance whose real value is shrinking), these owners, it is claimed by the upholders of the replacement view, carry additional risks. Entrepreneurs should not, in equity, be asked to shoulder the risks of rentiers as well as the specific risks inherent in business. Many witnesses argued (perhaps not entirely convincingly) that rentiers enter into the bargain open-eyed and can always avoid purchasing gilt-edged, whereas the owners of fixed assets are in some way committed to carrying on production.

But these arguments do not carry much weight. They either boil down to the view that business men and shareholders, thus discriminated against, cease to maintain capital equipment to the detriment of the community, in which case we are back at the erosion argument; or they lead to the view that business is unfairly taxed, which is not a specific argument against allowing only historical cost.[1]

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[1] Many witnesses asserted that replacement ought to be always self-financed, never financed through borrowing (B.B.A. Day 6 ; F.B.I., Day 4, p. 80, para. 28) and argued that taxation is responsible for the shortage of self-finance. The Commission reject both steps (342). Business can borrow to replace ; and the problem of inadequate funds arises from inflation, and may exist even if no tax and no dividends are paid. (Day, 7, 1887–1896).

(iii) *Revaluation of liabilities.* The question whether the liabilities of a business should be revalued as well as its assets is not merely a question of equity towards bondholders, but one that would seem to follow from the logic of the argument, and also one of equity between shareholders in firms with different gearing ratios. If there were no revaluation of debts, as well as of assets, the firm using its own capital would just be able to maintain its income (on definition 4, p. 327), whereas a firm with a large proportion of borrowed capital would make handsome windfall gains. There is nothing in the replacement cost view which would support such divergent fates. Yet only Professor Paish amongst the proponents of the replacement view advocated revaluation of liabilities.

(iv) *Undesirable discrimination.* Various attacks on the present system took the form that it discriminates against worthy companies. In particular, the following complaints were made: the present system
(*a*) benefits the firm with a large proportion of borrowed capital;
(*b*) discriminates against the small firm;
(*c*) discriminates against new companies;
(*d*) discriminates in favour of new companies.

(*a*) The benefit bestowed upon the firm with a large proportion of borrowed capital is not the result of the tax system but of inflation. Revalorisation of depreciation allowances or replacement allowances would not eliminate this discrimination, unless liabilities are revalued too. (See iii above).

(*b*) The argument that a firm with insufficient money to replace its assets should borrow is frequently met with the reply that only large firms can do this. Small firms have limited or no access to the capital market, and may find it impossible to get loans. (Mr. Harrod, Day 12, p. 267; Mr. Chambers, Day 4, 912; Mr. Bower, Day 5, 1181.) But if it is desired to correct this discrimination, it is surely both cheaper and more effective to give special concessions to small companies rather than general relief to large and small.

(*c*) Some witnesses believe that the present system discriminates against new enterprises and thus solidifies and stereotypes the present structure of business. (*E.g.* Day 5, Mr. Bower, 1183–1185). Presumably the argument would run along lines similar to (*b*) above, for new businesses are usually small and have difficulty in getting capital. One might also argue that as long as they are not earning enough to have something against which to set investment and initial allowances, these are of no use to them. But whatever the merits of this argument, it is impossible that a reform which would allow revalorisation or replacement cost could benefit new firms.

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[1] The criticism could be carried to a deeper level. The definition of 'net income' is based upon a value judgment. Only if we postulate that people do not eat at all in order to work, and do not rear families in order to continue production, can expenditure on food and rearing a family be regarded as income expenditure, rather than replacement. By freeing a slave, we convert what was a means of maintaining income into a use of income. An argument from equity would have to be clear about the value premises underlying its net income definitions. See W. Froehlich, 'Moral Judgments and Income Concepts', *Review of Social Economy*, March 1955.

(*d*) Indeed, Mr. Wiles complains that the historical cost allowance benefits the new firm whose historical costs are high. But this is not so much a matter of new v. old *firms*, as new v. old *assets* and the rate of their replacement. A very old firm may have a lot of quite new assets, and the assets of a relatively young firm may have been bought before those of a much older rival.

(v) *Inflation*. Some of the most fascinating discussions turned on the question whether the present system fans or damps the fires of inflation, and the corresponding question whether the proposed reforms would be anti-inflationary or inflationary in their effects.

The orthodox view, held only by economists (though not by all) and fiercely rejected by business men, is that the present system leads to higher tax payments in inflation, and lower in deflation, than the alternative system; the conclusion is that it thus has the right anti-cyclical effects. But several interesting objections have been raised to this view.

(*a*) Perhaps a minor, but possibly not negligible, objection is that tax payments are at least a year and possibly two years late. If the cyclical trend has changed, would it not be foolish to tax past inflated profits in a year of incipient depression ? A partial answer is that business sets aside tax reserves in the current year to meet future obligations. Thus the tax on the inflated profits will come out of reserves, not current earnings. Still, the psychological effect would work in the wrong direction.

(*b*) The general business view is that the present system is inflationary. It exaggerates profits in the boom beyond their ' true ' value, and leads therefore to excessive dividend distributions, to excessive investment, and to excessive wage demands, thus aggravating the inflationary process (*e.g.* Mr. Chambers, Day 4, 993: relief would reduce distribution of profits; Day 16, Mr. Bower, 4288, 4289 : historical cost accounting deceives business men into distributing or expanding their business too much.)

The argument is often reinforced by psychological considerations. Professor Paish stresses particularly the depressing effect in times of deflation when pessimism might spread because profits appear unduly low, being deflated by irrelevantly high historical cost deductions.

The business men's views are most convincingly rationalised by Professor Paish and put into words which make them, if not acceptable, at least comprehensible. The argument appears to be that that part of profits which is relieved from taxation would be used to increase business savings, whereas the tax would not have been used for public saving in the form of a budget surplus. It therefore implies that the loss of revenue has to be made up by extra taxation somewhere else. In so far as it is not an argument for equity for shareholders, the additional tax must fall on a narrower basis of profits on the reformed definition.

This view is neither very plausible (are we to believe that business increases its savings in times of rising prices but not its expenditure ?) nor is it compatible with the erosion thesis according to which relief is needed in order to increase replacement *investment*, not business *savings*. But it could be argued (and was argued by Professor Paish) that tax relief would raise business savings, which then could be used *either* to reduce inflation (if in fact present investment had led to inflation) *or* to replace capital (if the present balance is achieved by allowing capital to be run down).

In any case, these considerations open up interesting vistas of the investment function. The business view that replacement accounting will decrease investment in the boom could only be true if profit expectations are formulated in real terms. But if they are formulated in real terms, then the accounting procedure is irrelevant. On the other hand, if the business man calculates profit and loss in money terms, say, because his debts are money debts, he will not contract his investment, whatever the accounting procedure.[1]

But even if the business view is entirely correct, it constitutes a strong case for a reform of accounting and of company law, not of taxation. There is no reason at all why income for tax purposes must conform to the same definition as for accounting purposes. To ask—as some witnesses did—the tax system to educate and enlighten the business men is surely asking for something unreasonable, particularly if it involves loss of revenue or undesirable economic consequences. One can surely think of a more efficient and cheaper *memento mori*, if such is needed, than the tax bill.[2]

(*c*) An argument related to the above is that replacement cost allowances would increase the prices charged by business on the mark-up principle, and would, according to some, *therefore* be anti-inflationary (*e.g.* Mr. Chambers, Day 4, 994–997; Professor Paish, Day 9, 2600), according to others *therefore* be inflationary (through wage demands). In addition, Mr. Harrod thinks that the reform may improve our balance of trade, by enabling exporters to charge higher prices. Correspondingly one could argue, although nobody in fact did, on different foreign elasticity assumptions, that the reform would worsen our balance of trade. The reply to these arguments is as above. First, the postulated relation between accounting and pricing would have to be established. Second, even if established, it constitutes a case for reforming accounting and law, not taxation.

(*d*) The Commission dismiss most of this evidence, some of it contradictory, as too uncertain, and declare that the assertion that ' managements are misled to distributing more than they should ' because profits are exaggerated by conventional accounting ' rests mainly in imagination ' (357). On the other hand, they also dismiss what I described above as the orthodox economic view of the anti-cyclical character of the present system, because ' this analysis may attribute an exaggerated importance to the level of dividend distribution as an agent of inflation ' (357). The direct effects of dividend policy on consumers' demand must, of course, be negligible. But the indirect effects on wage claims—ignored by the Majority and mentioned by the

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[1] See W. Froehlich, *loc. cit.*, p. 90.

[2] See Mr. Wiles's evidence, Day 12.

Minority (p. 387, para. 102) —and on Stock Exchange values may be much more important. Although there appears to be a connection between dividend distributions and wage demands, it is not clear whether profits inflated by historical cost accounting and therefore heavily taxed are a stronger incentive to wage demands than apparently lower profits based on replacement accounting, but also more lightly taxed. In either case, it is uncertain to what extent high profits, whether retained or distributed, are merely an excuse or a reason for wage demands. In any case, it would be difficult to recommend replacement allowances on the ground that they would keep the trade unions quieter.

(vi) *Incentives.* The effects of the present and a reformed system of depreciation allowances for tax purposes on incentives may be discussed under three heads:

(1) the effect on the willingness to own productive assets;
(2) the effect on the willingness of business to save;
(3) the effect on the willingness to invest.

(1) Some witnesses claimed that the present system, by penalising the owner of productive assets in times of inflation, reduced his incentive to own these assets in favour of hoarding goods. The Commission agree that 'it would be a matter for concern if we had evidence to show that the necessity or these increased reservations had led to a flight from equity capital when offered to the investor, so that industry was being starved of access to new resources' (p. 107 para. 341). But the Commissioners go on to say that there is no evidence for such a flight.

(2) Professor Paish argued that the present system prevents business savings which would take place under a reformed system. (Day 9, 2605.) This point was already discussed in connection with inflation. Even if it were true—and it is by no means obvious—that revalorisation or replacement cost *accounting* would lead to larger business savings, this would, as was argued above, constitute a case for the reform of accounting and company law, not of taxation.

(3) One of the objects of revalorisation and replacement cost allowances is supposed to be the stimulation of gross investment. If the total tax on profits is to remain unaltered—and it must, or else the plea is one for general relief, not for exempting 'properly calculated' depreciation allowances—the marginal rates would have to be raised. This would clearly be a disincentive to investment. To this one may reply that, however attractive potential marginal returns, they are of no use to the firm with inadequate funds. But we have already seen that this is only a problem for the small firm, and the rapidly growing firm which can receive special concessions if that is deemed desirable. Otherwise the reform proposals clearly discourage investment. They are the exact opposite of the proposals for exempting wage earners from tax on marginal income.

Mr. Balogh, in his desire to encourage investment, goes to the opposite extreme. Far from exempting depreciation on a replacement basis, he proposed that tax should be assessed on gross earnings, *i.e.* before depreciation, but that all real capital expenditure, whether replacement or new, should be deductible. (Day 12, Memorandum para 26.) This would leave the incentive to take risks and to invest unimpaired. It would be a 100 per cent initial allowance. There would still remain a problem for new ventures or ventures where income falls short of capital expenditure. These would have to be especially catered for. But it is obvious that a measure of relief which claims to encourage investment must be related to the level of current capital expenditure. Revalorisation and replacement cost allowances are not.

One might object to Mr. Balogh's scheme (which goes back to Mr. Kalecki, Mr. Cary Brown and Davenport) that it would involve a substantial loss of revenue unless all existing assets which remain to be depreciated could be eliminated as tax deductions. An alternative scheme which would involve considerably less loss of revenue and achieve the same objective would be to permit firms to deduct *either* current investment outlays *or* conventional depreciation on total assets. The 100 per cent allowance is thus limited to progressive firms and the tax burden is shifted to the static firms.[1]

Stocks and the Computation of profit

Stocks resemble fixed assets in some respects, but differ from them in others. The resemblance is obvious, but the Commission stress the difference: in so far as stocks are used up in the accounting period, they are *current costs* to be set against current receipts. Stocks left over at the end of the year represent not values of unrealised assets but costs to be carried over against receipts of the next period. Therefore no problem of the valuation of assets arises here normally.[2]

But the question is still open *what current or actual costs* to enter: stocks are acquired at different times and at different prices. If the units bought cannot be identified with the units sold, some assumption must be made when prices change as to the date of purchase. The basis generally accepted in this country is 'first in first out' (F.I.F.O.), but the Commission recommend, curiously inconsistently after their powerful arguments against replacement cost in connection with fixed assets, that no single method should be obligatory because businesses are various in their nature. Either F.I.F.O. or L.I.F.O. (last in first out) are proposed as permissible methods, except by the Minority, and Professor Hicks and Miss Sutherland who reject L.I.F.O.

The main point at issue between the Hicks-Sutherland reservation and the Commission is the inflationary effect of the two methods of taxing profits, but the Minority raises wider questions of equity and policy.[3] There are

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[1] See E. Cary Brown, 'Taxation and Investment Incentives' in ***Income, Employment and Public Policy***, Essays in Honor of Alvin H. Hansen.

[2] The only exception occurs when a fall in the market value of the stocks may indicate that a part of the costs has become irrecoverable. Then the valuation at 'cost or market value, whichever is lower' consists of a revaluation downwards.

[3] The Minority not only reject L.I.F.O. as the basis for valuing what are presumed to be actual costs of acquiring stocks, but also the principle 'actual cost, market value, or value

[Footnote 3 continued on following page

also problems of the incentive to invest, to save, to buy cleverly,[1] etc. But this discussion will be confined to inflation.

In times of rising prices F.I.F.O. increases tax obligations above what they would be under L.I.F.O. In order to decide whether this is desirable or not, one has to distinguish between price rises which have their origin within the country and those which are due to external rises.

(*a*) *Internal.* The simple economic argument for F.I.F.O. is that it increases tax obligations in times of inflation and thereby reduces the spending power of business. The reverse is true in deflation. Against this view the following objections were raised:

(i) F.I.F.O. forces business to run down its stocks and this is wrong;

(ii) the nexus between taxation and business decisions is not as direct and simple as this view assumes;

(iii) F.I.F.O. is inflationary because it encourages excessive business expenditure;

(iv) F.I.F.O. is inflationary because it encourages excessive consumers' expenditure.

(i) ' Whatever may be the immediate economic consequences in terms of inflation or deflation, is it right that the tax system should be used as a weapon to force industry to run down its stocks ? ' asked *The Economist* of July 2nd, 1955, p. 54. Yet the answer is by no means so obvious as the rhetorical question implies. Surely economy in stocks *is* desirable in times of inflation. Why should Bank Rate be called upon to do what is forbidden to taxation ? It would be different if it were the case that taxation would deprive business of the bare minimum of stocks necessary to carry on production and trade. But there is no evidence that F.I.F.O. has had these calamitous results.

(ii) The anti-inflationary effect of taxing on a F.I.F.O. basis is greatly reduced by the fact that profits tax falls due a year late. This, according to this argument, cuts the nexus between business decisions and tax policy. And if there is a nexus, it might work in the wrong direction. Thus if in a slump year the inflated profits of the previous year are taxed, industry may not have enough funds left to replace its stocks. But the answer to this argument is that industry should set aside enough tax reserves in the high-price year to pay the tax in the low-price year. Still, a detrimental psychological effect may remain. This would be met by the recommendation of the Commission to move corporate taxation to a current year basis, and thus to create a more direct nexus between tax and business decisions.

(iii) The third argument is familiar from the discussion of fixed assets. L.I.F.O., according to this argument, by reducing book profits of business,

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on the base stock principle, whichever is lowest '—which is recommended by the Majority. The difference between closing and opening stocks of a year is a deduction from the costs of the year, or an addition to receipts. It is therefore in the interests of business men to minimise it for tax purposes. An unrealised loss on capital account can be used to reduce current tax liability.

[1] Mr. Wiles argued that F.I.F.O. penalises the skill of buying cheap.

would reduce business spending and increase saving. The reply, as before, is that, if there is anything in this view, it is a case for a reform in accounting. What is good accounting is not necessarily a good tax base.

(iv) The relation between accounting, pricing, and consumers' behaviour is interesting even though the argument is irrelevant to taxation. Several witnesses argued that F.I.F.O. is inflationary because it induces business to charge too low prices; this in turn stimulates consumption and thus leads to inflation *e.g.* Mr. Bower, Day 5, 1199. The underlying theory would presumably be that (1) price rises due to L.I.F.O. accounting are not matched by wage increases; (2) the elasticity of demand for the group of products to which L.I.F.O. is applied is less than unity; (3) the shift to profits is entirely saved by business; and (4) the loss of revenue is made good either by reducing government expenditure or by increasing taxation elsewhere. On these conditions, price rises would have an anti-inflationary effect similar to an appropriate indirect tax.

The view that higher prices are anti-inflationary, fairly typical of business men, is interesting for several reasons. In the first place, it would confirm the oligopolistic character of competition, for firms are not putting up prices in times of inflation to the full extent of the rise in the costs of stocks, although they could, and are not maximising profits. If this were general, it would have to lead to a falling share of profits in the national income in times of inflation.

Secondly, it would be difficult to square it with the other view, expressed by the same witnesses (*e.g.* Mr. Bower, Day 4, 1201), that taxation in times of inflation is passed on to buyers in the form of higher prices. If that view is accepted, on Mr. Bower's own reasoning the reduction of taxes should lower prices and, by the above reasoning, have inflationary consequences. Some witnesses obviously wanted to have it both ways. Mr. Bower argued that only some, but not everybody, can pass on the tax (Day 4, 1202). But if that is so, the case for reducing taxation on those who can falls to the ground, or, indeed, is reversed.

In any case, the tacit assumptions that would have to be granted before this analysis can be valid are too artificial. Indeed, other witnesses pointed out that L.I.F.O., whatever other merits it might have, would ' accelerate the wage-price spiral and the impact of higher import prices ' (Wiles, Day 12, memo. sec. 22)—if firms base their prices on the L.I.F.O. calculation of stocks.

(*b*) *External.* The situation is different if the source of the price rises is abroad. The Majority feel that the policy arguments for F.I.F.O. are much more debatable, though Professor Hicks and Miss Sutherland stand by their opinion. In so far as the higher taxes relieve the strain on the balance of payments, by forcing business to economise in stocks, the results are good. In so far as they intensify the shortage of liquid funds, the Majority say that the result is more doubtful (468). But this would appear to be a matter for credit policy, not for fiscal policy.

III. INITIAL AND INVESTMENT ALLOWANCES

The Commission do not regard these allowances as directly concerned with business profits in inflation (370). Their purpose is to stimulate investment in selected kinds of assets. At the same time, they do assist a firm which has to replace capital at inflated costs, in so far as its assets are covered by the allowance.

The business world regards them as thoroughly bad. When pressed, however, they admit that they prefer them to nothing.

The Commission confirm, what is by now generally known, that investment allowances are more than interest-free loans, for three reasons (408):

(*a*) the remission is reclaimable only against future tax;
(*b*) the allowance is available regardless of the borrowing power of the business;
(*c*) if the business continues it is a permanent loan, and if it grows, a larger permanent loan. In other words, it is a free gift if insufficient income is earned; and if the business continues, it is a larger gift if it grows, and a growing gift if it increases at a growing rate.

The Commission raise several objections to these allowances, which may be discussed under the following headings:

(i). they are unfair as between taxpayers;
(ii). they may encourage lobbying;
(iii). they are imprecise in promoting their objective;
(iv). they can have little effect on the large concern.

> (i) *Equity*. ' The effective collection of income tax depends in great measure upon its general acceptability and that in turn depends upon its reputation for fairness and impartiality. This argues for finding vehicles other than the tax system to convey the state's encouragement of particular economic purposes.' (R.C. 416).

It is difficult to follow this argument. If a policy is unfair, it is surely unfair by whatever vehicle it is conveyed. On the other hand, if policy is allowed to override equity, then why not through the tax vehicle ? But criticism can be carried further. The social *raison d'etre* of the profit system is that what is socially desirable shall be rewarded with profits. If this does not happen automatically, there is a case for intervention. The argument is analogous to the Benthamite argument of setting sanctions in law to harmonise conflicting interests. The use of discriminatory investment allowances—assuming they achieve their objective—is one of the methods through which private interests can be induced to pursue what is socially desirable. One can oppose such taxation only if one believes that natural harmony prevails and that there is fairness in the absence of selective taxation.

Perhaps a more fruitful line of criticism is to ask whether there is any form of taxation which is not, in its effects, inevitably discriminatory. Even if meaning could be given to a perfectly impartial system of allowances—so that ' equal ' allowances were given to all—this would still discriminate, *e.g.*, against those with insufficient income to deduct the allowances, and in favour of those who own real assets.

Besides the inequity between businesses due to the discriminatory character of the allowances, there is also the inequity between shareholders. The shareholders of those corporations which benefit from the allowances are favoured, and there is no economic justication for this (420).

> (ii) *Politics.* ' . . . accepting that there is nothing sacred about the canons of taxation, it is still possible to think that direct taxation at least is best resigned to a rather rigid principle of impartiality between taxpayers and that a democracy supported by universal suffrage ought to be particularly careful to guard itself against experiments in discriminatory taxation ' (418).
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> ' From the public standpoint, discrimination by industry is not unreasonably associated with the pressure group and the Parliamentary lobby ' (426).

These will probably become much-quoted words. Yet, could these electoral pressures not equally be exercised in favour of other measures? Similar warnings were expressed in the early days of redistributive taxation—only fiercer and sterner. But although redistribution on the income side is now accepted as a legitimate object of taxation (partly, of course, as a result of electoral pressures) production is still considered taboo. Yet there is no clear reason why this should be so. Since all taxation will have its—mostly unintended—effects on production, would it not be wiser to take these consciously into account and formulate policy accordingly?

(iii) *Unsuitability.* A more convincing argument would be, not that the allowances discriminate, but that they discriminate in an unintended manner, or that they do not discriminate enough. This criticism is implicit in what the Commission say.

> ' The categories of asset are so widely embracing that the process, judged as a method of selection, appears conspicuously imprecise for an instrument of taxation the whole justification of which lies in its service to the economic welfare of the State ' (415).

This is clearly a serious objection and the Commission recommend that the present very broad categories of favoured investment should be subdivided and that a range of different rates be introduced within those subdivisions. Discrimination by assets rather than industry may remove some of the objections.

(iv) *Large v. small firms.* The Commission argue that the allowances cannot affect the larger firms which make their investment decisions three or four years before expenditure occurs. As the allowances are regarded as temporary, and as they depend upon investment expenditure not investment decisions, they can exercise no stimulus. Small-scale expenditure, on the other hand, which is more important for smaller firms, will be encouraged by the allowances. The Commission note that this may give an unwelcome bias to the planning decisions of business—in favour of short-term expenditure in ready-made improvements and against longer-term and more fundamental planning (423).

But against this it must be remembered that smaller concerns have less income against which to set large capital expenditure. A new firm has none at all. Thus although the *decision* of a large firm may not be greatly affected, the allowances will benefit them considerably more than firms with insufficient income to absorb them fully.

Finally, there is a feature of the allowances which, though not directly relevant to the size and age of firms, *may* have a bearing upon them in such a way as to benefit the small or the new firm. The allowances will be relatively more important for investments with a low yield than for those with a high yield. This is so for the same reason that interest changes affect building more than motor-car production: the additional depreciation deduction (the lower rate of interest) forms a larger proportion of the returns on a low-yield asset than of those of a high-yield one.

(v) *Expectations.* A problem which the Commission do not discuss but which may become important if selective and variable investment allowances are going to be used more widely, is the manner in which expectations about future changes affect investment decisions. At one point the Commission indeed say that the best result would be obtained if expectations are created that the allowance is only temporary. In a system of variable timing of depreciation deductions, as exists in Sweden, such expectations would encourage quicker writing-off. In our system, they would advance the installation of equipment. But speculation may go the wrong way. The granting of allowances brings it home to the business world that the government hope to stimulate investment. If this leads to expectations of future higher allowances, investment plans will be postponed and this may force the government to take the step which it tried to avoid. And conversely, reductions of the allowances may be taken to indicate future removals. Investment will be stepped up.

IV. Taxation and Size

The problem in what manner our present system of taxation affects firms of different size differently cropped up in several connections. The initial question, whether the encouragement of small firms is a good thing, does not concern us here. Whether one takes a Schumpeterian view of size, or whether one takes the view, shared by the Fabian witnesses[1] and the National Union of Manufacturers, that small business is desirable, in either case a knowledge of the actual impact is important.

The following factors are said to militate against small companies:

(1) The high level of taxation forces companies to have greater recourse to outside finance, whether for replacement or for expansion, than would otherwise be necessary. But the imperfections of the capital market prevent, or at any rate impair, the access of the small company to the capital market.

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[1] Mr. Austen Albu and Mr. Roy Jenkins give a number of reasons for encouraging small companies: Day 14, p. 327, para. 31.

(2) The fact that the small firm cannot borrow as much as the large firm further aggravates its position, because debenture interest is exempt from profits tax. Thus the large firm has not only easier access to new capital, but, having borrowed, is favoured in comparison with those who have to depend upon their own capital.

(3) Certain expenses which can be deducted in assessing taxable profits enable the large firm to take greater risks and reap greater benefits, because it has more income against which to set off these expenses. The advantage is further increased if these expenditures are subject to increasing returns. Expenditure on advertising and workers' welfare are possible examples, but research is the outstanding one. The small firm can somewhat counteract this if contributions to research organisations and university research projects can be deducted.

(4) The present system, by favouring undistributed profits, (both directly, through the differential rate, and indirectly, through the high level of surtax and untaxed capital gains), encourages self-finance. This limits the flow of savings to outsiders and strengthens the established large firms. The Commission reject the differential profits tax, but not for this reason. Only the Minority use it as one of their arguments against differentiation. The argument against retention, however, is weaker, the more ignorant the private investor in comparison with the directors of the self-financing companies as to profitable investment opportunities, and the more imperfect the capital market, *i.e.* the stronger *other* obstacles to the channelling of funds into other enterprises. This is one of those cases where, given one type of imperfection, the addition of another renders the system more, not less, efficient. If distributed funds do not find their way into investment, it is better to encourage the ploughing back, even if this does not satisfy the highest criteria of sound investment.[1] Incidentally, the retention of profits hurts the poor shareholder

[1] Judged by its effects on *economic growth*, there are arguments for and against self-finance and hence a tax system that encourages this form of expansion. Industry and the bankers are in favour of self-finance (Day 6, 1723), although for obvious reasons against the differential rate. The arguments against encouraging retention are : 1, retained profits may not be invested ; 2, they lead to the wrong use of savings, preventing shareholders from investing where expected profits are highest ; 3, progressive firms have greater difficulties in raising capital because the market values of shares—presumed to be a function of distributed dividends rather than earnings—are depressed; 4, this strengthens monopolistic tendencies and encourages wasteful expenditure by firms which have more money than they can use.

The drawbacks of retention, stressed by the Commission, must, however, be compared with the drawbacks of its alternatives, debt and equity financing. Debt financing increases risks, makes it more difficult to raise equity capital, and, contrary to textbook doctrine, creditors are probably greater threats to the independence of management in their investment decisions than ordinary shareholders. Equity finance cannot be had by everyone, can be very costly, and the terms on which it can be recruited are worsened by the depression of share values in relation to capital values.

An argument in favour of self-finance, in addition to those in the text above, is that there is a stronger connection between retained profits and investment than between distributed profits and investment, in spite of what the Commission say about the tenuous link. Although not a sufficient condition (as the Commission argue correctly), they are in most cases a necessary condition of investment. The complaint of the Commission (78) that non-distribution relief provides no guarantee that the savings will be invested is weakened if it is remembered that the **ability** to invest is a necessary condition of investment. However strong the **incentive** to invest (say by exempting marginal earnings from taxation), if there is nothing to invest with, no investment can occur. It might be objected that if investment is a function of retention, it will be wrongly timed—too high in a boom, too low in a slump. But this is not necessarily so and could be counteracted by policy.

more than his rich colleague. The surtax payer would gain much less from extra distribution than he can make on capital gains.

(5) The initial and investment allowances can be set off against current income. But if no, or insufficient, income is earned to absorb the whole allowance, the allowance is lost. The Commission recommend that unexhausted capital and investment allowances should be capable of set-off against general income for any future year (506). (The Minority reject this recommendation on the ground that it would encourage avoidance devices such as the acquisition of unsuccessful and moribund concerns. M.D. 145) Although this provision would reduce the discrimination against small companies somewhat, it would not eliminate it altogether. Even in the most favourable case, when the question of the reduction or elimination of the allowance does not arise, there may be postponement.

(6) Some witnesses have claimed that historical cost depreciation discriminates against the small and medium-sized business. (Mr. Chambers, Day 4, 821). In so far as this is a matter of the greater difficulty of borrowing, it reduces to point (1). But there are two additional points. First, the problem of discontinuity in replacing capital equipment in times of inflation, which is at the core of the problem, is more serious for firms with few physical capital assets than for those with many. Thus a company with only one ship has more serious difficulties in accumulating a depreciation fund in times of inflation when historical costs are allowed than a company with many ships of different ages.

Secondly, the argument against the replacement cost view *as a basis for tax assessment*, that it may involve a higher marginal rate and thus discourage investment, is less powerful in relation to small companies. For although the alternative in the form of a relief which would apply mainly or only to marginal profits, but leave average profits heavily taxed, may indeed increase the *willingness* to invest, it may also reduce the *ability* to invest of the firm with inadequate funds. Thus there may be an argument for replacement cost depreciation as a tax basis, even though it might involve raising marginal rates, on the ground that it would increase the ability to invest of small firms. This point is really point (1), reinforced by a rebuttal of the generally valid incentive objection to replacement allowances.

(7) The possibility of setting losses against gains favours the large and the established firm against the small and the new one. In particular, where risks of innovation are important, the large and the established firms can branch into risky new lines, being assured of a Treasury subsidy in the form of a reduced tax bill if losses occur, whilst the new or the small firm would have to carry the full losses itself and may be forced into bankruptcy. It is now also possible for the current losses and profits of a group of companies to be consolidated for tax purposes, in accordance with a recommendation by the Tucker Committee. The Minority recognise the danger of tax avoidance and the encouragement of uneconomic risks and recommend that losses incurred by a subsidiary should be ignored where the subsidiary was acquired in the

knowledge that it was incurring a loss (M.D. 146). But as things stand, it pays to acquire precarious businesses which have made heavy losses as the flourishing firm can set these losses against future profits.

It is true that the situation is somewhat alleviated by the fact that business losses can be carried forward indefinitely as an offset against future income from the same source, and that they can be set off against income from any other source in the succeeding year.[1] But although these provisions benefit somewhat the smaller business, within that group they favour those with large incomes and a variety of sources.[2] A business without assured future income and without alternative sources of income does not benefit. Carry-back provisions would be an additional help, but the Commission—both Majority and Minority—reject these for practical reasons (486, M.D. 145).

Separate from, but in some respects related to, the difficulties of *small* firms are those faced by *new* firms (compared with old firms) and by *rapidly growing* firms (compared with more slowly growing ones).

Time and again witnesses lamented the fact that new businesses had to overcome monstrous obstacles to-day. Many of the arguments used in relation to small firms apply *ipso facto* to new firms. There is the additional trouble that personal savings, being subject to surtax, are no longer available for a private individual to set up business.[3] On the other hand, it is always open to him to incorporate himself and to get the benefits of a corporation. Thus, not only is the demand for risk capital from small firms relatively smaller, but, as a result of redistributive taxation, the supply is also reduced. Small savers prefer pension funds, savings banks, building societies and insurance companies—all of which are cautious lenders. Their capital is largely available to the successfully established and large concerns.

Against this, there are also factors favouring the *small* and the *new* firm, apart from such institutions as the Industrial and Commercial Finance Corporation and the National Research Development Council.

(1) There is a minimum exemption limit from profits tax at £2,000 per annum, and abatements up to £12,000 per annum. But these provisions can also be used by large firms to avoid tax liabilities. Large firms have been tempted to conduct their business through a number of separate companies each getting the benefit of the relief. (Para. 557, 1031). The Commission therefore recommend that the exemption and abatement reliefs should be removed.

(2) We have seen that investment and initial allowances may have a greater

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[1] The Minority recommend that losses should be offset only against future income from the same source.

[2] It is a general characteristic of all allowances against tax liabilities that they discriminate against those whose income is insufficient to absorb the allowance. The situation is similar to that of low income earners whose income is less than the allowance to which they are entitled. But although this can be looked upon as a form of discrimination against small incomes, from an incentive point of view such a situation may be welcomed: the low income receiver with an unabsorbed allowance has an incentive to earn enough to benefit fully from the allowance.

[3] Memorandum of the F.B.I., Day 4 para 20. Mr. Chambers, Day 4, 821, 835; Mr. Nelson, Day 16, 4481.

effect upon the investment decisions of small firms, because their planning decisions are less long-range. They are in a better position to adapt their investment decisions to make the best use of the allowance.

(3) Mr. Wiles argued that historical cost accounting favours the new firm, but we have seen that this would have to be qualified in several important respects.

It appears that on balance our tax system favours the large firm and the established firm, and may well encourage the trend towards concentration and monopoly. Whether this is good or bad is another question. It is certainly not self-evident that this is necessarily wrong.

Finally, there is the differential treatment of firms growing at different rates. The present system handicaps the *rapidly growing firm*, particularly if it is new and small.

The rate of growth of a firm is a function of the rate of investment. This may have to be qualified in various respects, but holds good as a rough approximation. Up to a point, a more rapid rate of growth will yield higher total returns and thus larger resources with which to finance that higher rate. But beyond a critical point, financial requirements are likely to exceed retained profits. Since taxation reduces profits, it also reduces the maximum rate of growth that could be financed out of retained profits. Although, therefore, for industry as a whole, or even for particular industries, there is no shortage of internal savings, this may well be the combined result of (*a*) the savings of the static firms exceeding their investment, and (*b*) dynamic firms straining against financial limitations. Although the latter can borrow, the power to do so is limited by their own resources, and thus by their rate of growth. The recruitment of additional share capital is made more difficult by the depression of share values below capital values which is due to taxation : it would be the result even of a *uniform* profits tax, if companies distribute a smaller proportion of net earnings as taxes rise, and is aggravated by the *differential* tax falling more heavily on distributed profits.

V. Overseas Profits

One of the questions which the Commissioners asked many witnesses was this : should overseas profits of British companies be treated preferentially ? The subject is controversial and the Commissioners were divided. They agreed that neither income from overseas investment (as distinct from profits of overseas trading) nor overseas profits distributed to residents in this country should receive preferential treatment. The dispute is limited to the treatment of the undistributed overseas profits of limited liability companies.

The case for the exemption of overseas profits from U.K. taxation is that we need overseas earnings and that the present system puts British overseas traders into a worse position than traders from other countries. In the business world the view that exemption or preference is essential to our foreign trade is almost axiomatic.

> Mr. Millard Tucker : ' . . . what I want is the unanswerable argument that British companies trading abroad should be relieved of their liability to tax. . . In fact, that is what everybody is talking about at the moment, increase your exports, and that is an export, the carrying on of business abroad, is it not ?—Mr. S. P. Chambers : ' Yes ' (Day 4, 1067).

The position seems to be aggravated by the following considerations : Most other countries not only levy lower taxes, but they also grant special exemptions or preferences on foreign profits. Some countries offer tax relief to foreign companies which will develop local resources, but such incentives are lost on a U.K. firm. Shipping and mining companies in particular claim that their inability to build up adequate replacement reserves puts them at a heavy disadvantage in competition with rivals from less highly taxed countries.

The case against exemption is argued with greater cogency, although the conclusions and recommendations of the Commission are not consistent with their own arguments. There are strong considerations against preference, both on equity and on economic grounds.[1] For the purpose of *equity*, the relevant comparison is not that with foreigners but with home traders : there is no reason why overseas traders should get off more lightly.

The comparison between the U.K. trader and his overseas competitor is relevant only to the question of *economic policy*. Should we discriminate in favour of overseas trade in order to improve our balance of trade ? The Commissioners who oppose exemption argue :

1. If we want to favour overseas trade, the disadvantage of overseas business in accumulating reserves compared with their foreign rivals is not the only, or the main one. ' It is common to all businesses which produce for export, and it may even affect industries which produce for the home market, if they have to face overseas competition.' (650). But such large-scale relief, even if it could be shown to be desirable, would be impossible to administer and would, even if it could be administered, lead to such a severe loss of revenue as to be ruled out.

2. A concession to overseas profits only would encourage overseas investment and on that score worsen, not improve, the balance of payments.

3. It may, of course, be that later on higher overseas investment will increase the value of exports. But it is doubtful whether the current sacrifice is justified by the future benefit. This country ' is already investing abroad more than it can afford.' (653).

4. If overseas investment occurs, at the expense, not of home consumption, but of home investment, our *ability* to produce for export is reduced, even though the *demand* for our exports may have been raised through the concession.

5. A concession to overseas profits would cause investment to go abroad —where it would raise the revenue of the foreign government—and reduce the proportion remaining at home, where its earnings would have increased the revenue of our government.

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[1] They were already clearly stated by the Royal Commission on the Income Tax, 1920 (Cmd. 615, paras 30–39, 81).

6. They conclude that those activities should be encouraged which increase exports with a minimum of overseas investment.

On the face of it, it seems paradoxical that it is proposed both that the U.S.A. should invest abroad in order to reduce her surplus, and that the U.K. should invest abroad in order to reduce her deficit. The answer in both cases, depends, of course, on the relation between the current transfer on capital account (worsening the balance) and the future flow of returned earnings in relation to future additional foreign investments.

An exemption of undistributed overseas profits from taxation will be a clear incentive not to remit profits to the U.K. On that score it will worsen the balance of payments, *cet. par.* But, on the other hand, the exemption will provide an incentive for companies to stay in this country. (At present this is enforced by the 1951 Finance Act[1] which makes Treasury consent necessary for emigration.) It is claimed that local residence benefits the balance of payments because resident directors are more likely to order from British firms and that it generally helps ancillary business and employment.

But such analysis, in the Report's own favourite words, is ' incomplete '. Not much can be said until we know something about the effects upon the balance of trade and the terms of trade. As far as the balance is concerned, there are reasons to believe that the encouragement of overseas investment is likely to worsen it. In an article in the *District Bank Review* of September 1955, Mr. John Dunning shows how American subsidiaries have greatly improved Britain's trade balance. ' So it would seem that American manufacturing firms in Britain, by benefiting from the research and manufacturing experience of their parent concerns and often from established overseas sales and distribution outlets, have helped—and are helping—to further the growth of Britain's newer exports, and to put this country in the forefront of developments in international industry.'

Mutatis mutandis, British foreign investment will encourage the exports and import substitutes of foreigners. This will reduce our export receipts. Parent concerns will have an interest to route foreign orders through their subsidiaries abroad. Subsidiaries abroad may stimulate foreign competitors into greater efficiency. It is by no means clear that our future receipts from these foreign investments will be greater than the loss from the expansion of foreign exports and import substitutes resulting from the investment. Unless it is argued that the foreign investment contributes to a growth of total trade that would otherwise not have taken place, this is a real loss.

Similarly, the encouragement of foreign trade and foreign investment may turn the terms of trade against us. If the foreign profits are earned in competition with or through expansion of our exports where competition is fierce (and this is suggested by the witnesses) the prices of exports may have to be lowered. Moreover if, as the business world asserts, and some theoretical considerations confirm, tax is passed on to price, the concession amounts to subsidising the prices of exports. On Mr. Harrod's and Mr. Hawtrey's argument this is highly undesirable—quite apart from the violation of international commitments. If the concession leads to a reduction in the prices of our imports or the development of import substitutes, the terms of trade will tend to improve, but this is not the situation envisaged by those who pleaded for the relief.[1]

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[1] Section 36 of the Finance Act, 1951, was incorporated in the Income Tax Act, 1952, as Section 468. The Commission recommend that it should be explicitly recognised as an emergency regulation (1046).

There is also the effect on the *incomes* of the inhabitants of the foreign countries. British companies operating abroad may raise these incomes with the familiar ambiguous effects on our trade balance. They may buy more from us because they are richer, and this may be reinforced if they develop tastes for British goods, as American oil companies do successfully for American goods. But by teaching them to do more for themselves and by enabling them to use more of what they previously exported, our balance would be worsened. A policy which aims at improving our foreign trade position would have to be more selective than indiscriminate fiscal encouragement of overseas investment and of the retention of profits abroad. Such a policy is at least as likely to reduce our export receipts and to raise the prices of imports as to produce the opposite results.

In spite of these difficulties which are not raised, and in spite of the objections which are raised, a majority of the Commissioners recommend that the profits of a newly introduced special category of corporation—the 'overseas trading corporation'—should be exempted from tax so long as they are undistributed. Although it is clearly undesirable that overseas business should be discouraged from having its central management and control here—as it is under the present system—it is difficult to see how the Commission can recommend such a scheme, as it does, on grounds of general economic policy—when the weight of the economic arguments lies on the other side, particularly if it is remembered that the proposed corporations would be a suitable vehicle for tax avoidance: by over-pricing its sales to, and under-pricing its purchases from, the overseas subsidiary, and by routing orders that might have come to it to its subsidiary, the parent company can remove some of its profits from taxation.

However, an argument has been advanced in favour of this type of relief, which is based on a wider than a narrowly national point of view. It was discussed in the First Interim Report of the Commission (Cmd. 8761, paras. 33 and 51–60). Relief to overseas profits may be an indirect way of helping the Colonies and undeveloped countries generally to recruit capital. As things are, concessions granted by these countries to foreign capital fail in their objective as far as U.K. firms are concerned. They merely reduce the revenue of these countries and swell the coffers of the U.K. Exchequer. It does, of course, follow that if the Colony raises its tax rate or takes away the concession, the burden falls on the U.K. Exchequer and there is no deterrent on the U.K. concern. To that extent our tax provisions encourage foreign countries to impose heavy taxes on U.K. firms.

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[1] The Minority also accept as axiomatic the principle that foreign *trade* (though not foreign investment) must not be discouraged in another connection. They would like to see deductible expenses drastically cut to unavoidable items such as fuel, wages, material, but fear that this would impair the activities of our overseas traders, if they are not allowed to deduct selling and promotional outlays.

Furthermore, if the double taxation agreements which create this problem were generally abandoned, the undeveloped countries would gain little. They would be competing with each other to attract capital and would sacrifice the revenue which they receive at present in the process. Ultimately, they are not likely to attract more capital than now, although they will have sacrificed a good deal of revenue. Thus the double taxation agreements are probably in the interests of the undeveloped countries.[1]

A possible way of benefiting from foreign concessions, in spite of existing double taxation agreements, is the formation of subsidiaries with control in the foreign country (which would require Treasury consent under the 1952 Act). But even then the benefits of the concession are lost if the profits are distributed to the U.K. parent company, and, in any case, subsidiaries are not always desirable or feasible.

The decision to give relief on the ground of assisting poor countries in their development policy ought to be taken with the clear knowledge that (*a*) they may benefit least the poorest countries and that (*b*) they may be against the interests of this country. Assuming the total of British investment abroad is allowed to rise, the share going to the poorer areas is likely to be small. As far as Britain's own interests are concerned, quite apart from the strain on Britain's resources that this may involve, the type of enterprise encouraged by overseas tax concessions might be one that eventually reduces our exports, or raises the prices of our imports. This would be against the proviso of the Commission that ' only such activities within the United Kingdom should be within the exemption of the (proposed scheme) *as the economic interests of the country are seen to demand*.' (R.C. 690).

The Minority believe that the development of the backward areas of the world ' is a prime objective of our national policy ' but consider double taxation relief a sufficient contribution, (M.D. 168) and reject the proposed overseas trading corporation.

VI. TAXATION AND INCENTIVE

(i) *General remarks*. There are two propositions which, though obviously correct, are repeatedly denied by witnesses in their memoranda and oral evidence :

(1) Taxation as such is no real burden to the community.

(2) Taxation as such has no disincentive effects.

There is, however, more insight into (1) than (2). Many witnesses recognize that taxation by itself is anti-inflationary in so far as it falls on expenditure, and redistributive, in so far as it leaves efficiency unchanged. The real burden to private persons is not the tax but the government's claims on resources.

Perhaps it is too much to expect the witnesses to adhere to the terms of reference of the Commission. Almost all primarily complain about the weight of the total level of taxation, and only to a lesser degree of its distribution. Business and trade unions are united in the view that all taxes are deterrents and the higher the total, the worse the deterrent. (*E.g.*, Memorandum by the A.B.C.C. section 3, who use the same words as Mr. Geddes for the T.U.C., Day 10, 2785). Yet, it is clear that to the problem of incentive the *level* of taxation—as long as tax rates are less than 100 per cent—is entirely irrelevant. Not the rates of tax, but their progressiveness and their impact on marginal income may deter risk-taking and effort. Thus it is the fact that gains increase tax liability more than equivalent losses reduce it, not the payment of tax as such, which dampens enterprise.

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[1] See J. R. and U.K. Hicks, *Report on Finance and Taxation in Jamaica*, para. 144.

There is a dilemma between equity, which requires progression, and incentive, which is reduced by progression. In theory, it is possible to resolve this dilemma by the device of progressive lump-sum taxes, assessed not on a man's or a firm's actual performance, but on his or its potential, or standard, performance. If such a system were possible we could at the same time equalise incomes and leave incentives to work, to save, and to take risks unimpaired.

Clearly a completely detailed knowledge of potentialities, or a fair determination of ' standards ', is impossible, and even if it were possible, its costs would be prohibitive. Moreover, it would be difficult to see how far the application of the principle could go without violating our ideas of freedom. One might, perhaps, be prepared to tax the income of workers which they would have earned, had they not taken a day off. Perhaps the same could be applied to the incomes of doctors and lawyers. But would Mr. Harrod, one of the advocates of such a scheme, apply it to men who give up high incomes from business in favour of an academic profession which they prefer on non-pecuniary grounds ? Should they be taxed on the maximum which they could have earned ?

Yet, it might be worth considering for certain purposes the use of broad categories which are related to some ' standard income ', which may be fairly low.[1] The standard income could then be taxed at a high rate and income above it would remain untaxed. If excess earnings affect the assessment of the standard income, a disincentive to move into the higher category would remain. Equally, there will be strong resistance to raise the ' standard ' within any given category. On the other hand, if the standard ceases, as time goes by, to be a measure of potential, standard, or minimum performance, unjust reliefs are enjoyed.

Several proposals submitted to the Commission approximate this principle. Many aim at delaying the impact of high marginal taxation by taxing extra income in the current assessment period at a rather low rate (Mr. Hughes and Mr. Booker, Day 8), others advocate assessment on a standard week. (Mr. Harrod, Day 12).

In so far as the former proposals rest upon the assumption that *current* tax payments influence *current* effort (although assessed on past effort), they are similar to the standard income proposals. They were rejected by the Commission both on grounds of fairness and practicability.[1]

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[1] In some exceptional cases this is already the practice. Earnings from tips of railway porters and waiters are, I believe, assessed on an assumption of standard earnings.

(ii) *Taxation and risk-taking*. There is unanimity amongst business men that taxation discourages risk-taking. Without wanting to enter here into a detailed discussion of this complicated topic, it is worth bearing a few points in mind :

(1) What is generally asserted is by no means certain. It can be shown that even a progressive tax with full loss offset provisions *encourages* risks-taking. Since existing loss offset provisions are not complete, the results must be doubtful.

(2) Although the purported reduction in risk-taking is generally deplored, it is not obvious that risky investment is more desirable than safe investment. Assuming that rapid economic progress is the desideratum (itself disputable beyond a limit), an economy will grow rapidly the more people invest in economic and social productive capacity, and not in ventures which may result in losses.

(3) Risk is subjective : what may seem very risky to A may seem perfectly safe to B. Unless opinions are uniform, it is impossible to predict the effect on demand for particular types of assets resulting from a tax that discourages risk-taking. The results will depend upon the distribution of these assets among people of different opinions.

(4) Risk also depends upon who takes it : People vary not only in their estimates, but also in their capacities to shoulder risks based on the same estimates. What is safe for a protected monopolist may be foolhardy for a firm in perfect competition.

Given these considerations, it is difficult to see any significance in such statements as ' Taxation discourages risk-taking '. But, granted the fact of deterrent taxation and granted its deplorability, its effects on risk-taking can be mitigated by actions of the tax payer and by tax legislation. One effect on the tax payer is to force him to reduce his individual risks (which does not necessarily imply that total risk-taking is diminished) : he may seek fuller information; the tax may make it worth his while to pay for it; or he may be encouraged to pool his risks; or he may devolve them on to others.

On the side of the tax authorities, the way to meet the deterrent effect is to allow averaging of income over time. The Commission, recommending the withdrawal of the existing provisions for authors and others, say (perhaps slightly ambiguously) ' Irregularity has no special connection with the creative arts ' (191). Instead, they recommend that a fall in total income from one year to the next of at least 50 per cent should entitle the recipient to relief by averaging.

Although the Commission see the theoretical advantages of a general scheme of averaging income over a period of years, they reject it as administratively impossible.

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[1] Second Report, Cmd. 9105.

(iii) *Taxation and incentive to work.* One of the questions which the Commission put for the guidance of intending witnesses was ' Is the present system of taxation satisfactory, or could it be improved, in relation to : (*a*) incentives ? '

We have seen that it is almost axiomatic for the witnesses from business that ' all taxation is deterrent ' (Memorandum submitted by the A.B.C.C., section 3), although they are not altogether consistent in this. Thus in section 6 of the same memorandum it is said that ' taxes on income can, therefore, work both as an incentive and as a disincentive to further effort '.

The generally accepted theoretical analysis, based on the assumptions (*a*) that the utility of income, the utility of leisure, and the disutility of effort are independent of each other, and (*b*) that people know how they are affected by the tax, shows that the net change in effort after the imposition of a tax is uncertain. In equilibrium $\frac{du}{dy} \cdot \frac{dy}{dr} = \frac{dv}{dr}$, where u is the utility of income, y income, v the disutility of effort, and r the amount of effort. A tax will increase $\frac{du}{dy}$ (if the marginal utility of income diminishes with income), but it will diminish $\frac{dy}{dr}$, so that the effect on the amount of effort supplied is uncertain. In spite of numerous dogmatic assertions, very little concrete evidence emerged that taxation is a disincentive to work. (*E.g.*, Day 8, 2088). What little evidence there is, is unreliable because of the difficulty of isolating particular motives. Taxation appears to be used as a welcome excuse for not doing what would have remained undone in any case. One gains the impression, confirmed by the report of the Social Survey, that the complexity of P.A.Y.E. removes its disincentive effect (apart, possibly, from tax repayments when income falls), because few workers know how they are affected by income tax.[1] Professed views are neither reflected in behaviour, nor do they reflect the facts.

In view of this, it may not be very rewarding to explore the abandonment of assumption (*a*), *viz.* independence. Yet, a few words may be in place since so much has been written that is based on the assumption. Very little attention has been paid to the possible interdependence between ' income ' and ' leisure '—if we define income as assessable income, and include in our definition of ' leisure ' services rendered to oneself and one's family.

Thus it is possible that, after the imposition of tax, not only more effort is supplied, but, in spite of the rise of the effort price of income, *more* income is demanded. (Income would be an ' inferior good '.) Consider a person who, when his income is sufficiently high, can afford to take time off to wash dishes, decorate his house, look after his children and garden and to go fishing, perhaps write poetry and take part in amateur theatricals. When his income is reduced by a tax, he may have to reduce his leisure in order to maintain his standard. But having reduced his leisure, he now finds that the marginal utility of income has greatly increased as a result : he now needs a maid to wash his dishes, a nurse to look after his children. Not having enough spare time for gardening, decorating, fishing, poetry and theatricals, he now has to purchase more vegetables, labour, fish, books and cinema entertainment. This effect may be sufficiently strong to more than offset the deterrent from the reduced reward for marginal income. The marginal utility of income is increased, *because* ' leisure ' is reduced.

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[1] *Cf.* Appendix I to the Second Report of the R.C. : a report on P.A.Y.E. and Incentives, by the Social Survey.

It is also possible that the marginal disutility of effort is increased when income is reduced. A reduction in income may raise the disutility of any given amount of effort because certain amenities which eased the burden of work can now no longer be afforded. Items of food or drink or cigarettes which made work more bearable can now no longer be bought; one has to take a bus instead of driving in one's own car to work; one has to use the canteen instead of a restaurant for lunch, etc. The disutility of effort is thus not merely a function of the amount of effort, but also of the amount of income, and thus of the price paid for effort.

The assumption underlying the common belief that a tax will normally reduce the supply of effort is that the substitution effect between income and leisure (making for reduced supply of effort) will be stronger than what might be called by analogy the ' income effect '(making for increased supply of effort). In fact, however, income and leisure are very imperfect substitutes. A higher income requires more time to spend it in. A lower income reduces the attractiveness of leisure hours. For many, leisure is ' equipment purchased with their working hours '.[1] In such cases the substitution effect will be weak or absent and the income effect will predominate. A proportional or even a progressive tax will not deter effort by much more than an equivalent poll tax.

In the case of complementarity[2] between income and leisure people work in order to be able to spend money during their leisure hours.[3] Quite compatible with this situation and leading to similar results is one in which people want to work, or rather earn income, in order to avoid having to spend money. A good deal of attention has been paid by the Royal Commission to this problem, but not in connection with the question of incentives.[4] The problem arises from two sources :

1. Benefits in kind which are not taxed;
2. Deductible expenses which contain a personal benefit or add to the personal prestige of the taxpayer, whether incurred by his employer (in

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[1] I sit in my room in comfort
Looking at enormous flowers—
Equipment purchased with my working hours,
A daily mint of perishable petals. (Louis MacNeice).

[2] ' Complementarity ' is used in a loose sense, not in Professor Hicks' strict sense. See *Value and Capital*, p. 44.

[3] ' The trouble about leisure is that it can be so very expensive. When we get a general thirty-hour week, I think most people will have to have two jobs.' Mr. Kenneth Horne.

[4] The Minority mention this problem in passing. (M.D. 116).

which case they may take the form of benefits in kind or the discharge of obligations on behalf of the employee or director) or by the employee himself.

The interest of the Commission was focussed on the correct treatment of these for tax assessment. But the implications on incentive may not be negligible. While at work, expenditure which would have to be incurred if no work were performed is avoided. When clerks work overtime they are provided with the expense of a meal. (Day 20, 5505). Directors are provided with expensive flats in London to entertain visitors from abroad (5484). The situation has some parallels with loss offset provisions in the case of risk-taking. Expenditure which represents costs when incurred in the course of supplying effort is not deductible if no income is earned. (It may, however, be paid directly by the company or employer). Accommodation, meals, fuel, working clothes, service, equipment, travel, entertainment, etc. can be enjoyed (partly or wholly) without having to be paid for out of income, when income is demanded, but not when leisure is demanded. Income thus may be wanted, not in order to afford a source of expenditure but, on the contrary, in order to *prevent* expenditure. By earning you avoid having to spend.

It is true that since the legislation of 1948 ' home savings ' (*i.e.* living expenses avoided by business travel or entertaining) have, in some cases, been deducted from expense allowances, and certain benefits in kind have been taxed. But this does not affect the general argument. First, the Commission recommend abolition of these deductions;[1] second, they are not in fact deducted in all cases even now, and third, some of the allowable expenditure might well be expenditure which the tax payer would have wanted to incur out of taxable income, or which bestows a personal benefit.

Another qualification would have to be made, theoretically, where, as a result of additional work, a man saves, not expenditure out of income, but deductible expenses. The Commission discussed with the witnesses from the Board of Inland Revenue the case of the company director who goes abroad, expenses paid, and thereby saves his expenses at the Ritz (Day 21, 5767). In practice, little would probably be deducted and the qualification is therefore not very important.

It appears that this must be important for schedule D assessments where the tax payer is largely left to judge what he is obliged to spend on expenses, and may be significant for shedule E assessments. If the Commission's recommendation is adopted that the schedule E rule should permit expenditure ' *reasonably* incurred ' for the appropriate performance of the duties of the office or employment, the scope of this consideration would be enlarged.[2]

This type of expenditure is partly a function of leisure. A reduction of leisure will reduce the marginal utility of income, while an increase in leisure will raise it. The effect is the same as if income and leisure were imperfect substitutes, though the motivation is different. Substitution effects will be less than what they would otherwise have been, and the deterrent effect of a tax will be reduced, at any rate up to the point where income falls short of deductible expenses. That this is clearly so, in spite of the jeremiads of the deterrent effects of taxation, is shown by the alacrity with which schedule E men jump at opportunities which give them a schedule D assessment. Dons are zealous to become consultants, in spite of the high marginal rates of taxation, because the additional effort reduces their income-expenditure. A tax will, of course, encourage the inclusion of what would have been expenditure out of income (including expenditure on leisure) under expenses.[1] In so far as the entanglement of business with living arrangements is encouraged—using home as office, maid as office cleaner, wife as secretary[2]—the argument as to incentive is invalid.

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[1] The Minority dissent (M.D., 187).

[2] The Minority's recommendation to make earned income relief available without upper income limit (M.D. para. 129) would not have these results.

Summary. If we abandon the assumption commonly made that the utility of income, the utility of leisure, and the disutility of effort are independent of each other, a variety of things may happen when a tax is imposed, of which the following are illustrations : (1) If the marginal utility of income is increased as a result of a reduction in leisure, more income will be demanded and hence more effort supplied than if this interdependence did not exist. If this effect is sufficiently strong to offset the substitution effect, the case is analogous to the Giffen case. (2) If the marginal disutility of effort is increased as a result of a reduction in income, less effort will be supplied than if this interdependence did not exist. The substitution effect will be reinforced. (3) If the marginal utility of income is increased as a result of an increase in leisure, more effort will be supplied than if this interdependence did not exist. The income effect will be reinforced. This type of interdependence may exist either (*a*) because income and leisure are complementary or (*b*) because earning income through effort is expenditure-saving, under ruling provisions for expense allowances.

VII. Equity and Economic Policy

Several witnesses were asked by the Commissioners whether they approved of taxation as an instrument of economic policy in addition to its ‘ purely fiscal ’ function. (*E.g.* Lord Cohen, Day 4, 840). Witnesses from the business world regard the former as ‘ a thoroughly unsound procedure ’. (Mr. Chambers, *ibid.*)

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[1] Other effects of the growth of benefits in kind and expenditure that can rank as business expenses might be worth exploring. It encourages not only a new kind of truck system—employees enjoying part of their incomes from provisions of their employers,—but also self-sufficiency within the household and the firm. Thus it pays a motor firm to employ building labour to repair the houses of its employees, even although this is substantially less efficient and more costly from a social point of view than outside labour which would have to be paid for out of the employees' taxed income. This militates against the division of labour and reduces productivity.

Another aspect of this problem is discussed by Mrs. Jackson who in an amusing essay reverses the hackneyed question ‘ Can private enterprise survive the tax system ? ’ and asks more pertinently, ‘ Can the tax system survive private enterprise ? ’ (*The Twentieth Century*, July 1955).

[2] Although our tax system encourages the use of wives as secretaries, the reverse is not true : it discourage the transformation of (at any rate highly-paid) secretaries into wives.

Although all witnesses who were asked had strong views on this question, it is difficult to make sense of this distinction. Even if it were possible to give meaning to ' a purely fiscal ' tax, it would, of course, have indirect economic repercussions. Only a fiscal system which combines such a purely fiscal tax with full knowledge of the intricacies of its incidence, and successfully offsets any *economic* effects, could claim to conform to the ideal of these witnesses. But such a utopia does not exist, even if it could be conceived.

The first difficulty is to decide what a ' purely fiscal ' tax is. It appears to combine ' neutrality ' with ' fairness '. Presumably, it is one that is impartial. Yet impartiality is not enough, or else one could leave assessments to be decided by the toss of a coin. Is it a tax that treats everyone equally ? Let us imagine a conversation with a believer in ' purely fiscal ' taxation.

Does equal treatment mean that we should tax everybody an equal amount ?—No, the rich can and should pay more. A proportional tax then ? —No, a tax should take fully into account the ' ability to pay '[1] and the rich are able to pay more than proportionately. By equality I mean that the tax should treat *equal incomes equally*, regardless of whose income they are. No distinction between earned and unearned income, no relief for life insurance and superannuation contributions ?—Oh yes, I should have been more precise: we must differentiate, for there are special reasons why earned income, and certain savings out of earned income, should be relieved—but there discrimination must end. Do you propose then the same allowances, irrespective of the number of children ?—No, it's only fair to give larger allowance to the father of more children.—The same absolute amount for each child, or the same proportion out of income, or perhaps a progressive proportion ?—The same absolute amount, I think; but I am not sure what equal treatment here requires.—Shouldn't the person who is paid annually and whose income is more secure be taxed at a higher rate than the weekly wage earner?[2] —Well . . . —And would you oppose an increase in taxation in times of inflation on the ground that this would be in pursuit of an economic policy, and no longer ' purely fiscal ' ?—No, the use of taxation for a general economic purpose is sound. Where there is a general principle, I am in favour of it. I merely object to particular discrimination.—But an anti-inflationary tax ought to fall on expenditure. Would an exemption of savings violate equity ? —Yes, it would violate a general principle of equity.[3]—Does not the principle of equal treatment entail that you ought to tax generous and carefree people, who set little store by money, more heavily than misers and people whose needs greatly depend upon money ?[4]—No, this would be an irrelevant distinction and therefore discrimination.

[1] R.C., 79.

[2] *Cf.* Professor Hicks, Day 10, 2760. The proposal goes back to J. S. Mill, *Political Economy*, Book V, ch. ii, para. 4, note.

[3] R.C. 63.

[4] Thus it could be argued that married men should be taxed more highly than single men, and family men higher than childless ones. Since it is always, presumably, open to a married man to remain single, and to a family man not to have children, these are preferred positions—on the normal assumptions of identical tastes but unequal opportunities—placing them nearer the summit of bliss. Hence equity requires that they should be more heavily taxed than their more unfortunate fellow-men whose level of satisfaction is lower ; any dip into it is felt more painfully.

If we assume different tastes and start with an equitable tax system, any shift in relative prices requires a change in the tax system, unless the meaningless concept of money income is taken as the basis of judgment.

' Impartiality,' ' fairness,' and ' equality ' can be interpreted in a variety of different ways and many forms of discrimination can be subsumed under such interpretations. Yet at some point the defender of the principle will draw the line and reject discrimination without being able to say more than tautologically, that *that* would be *discriminatory* discrimination, or differentiation where there ought not to be any. The trouble is that the difficulty of devising a system of ' purely fiscal ' taxation is not practical but logical. The canons conceal political prejudices. If these are widely enough shared, they gain the status of Principles. As long as taxation is not entirely *ad hominem*, some general principle could be formulated which ought to be acceptable to some. And with ingenuity, even *ad hominem* taxation could be framed in a non-discriminatory fashion.

Yet having said this, it is difficult to escape the objection that, however great our differences on what is equal treatment and what discrimination, we would all agree that some considerations are irrelevant and ought not to form the basis of discrimination, such as colour of hair or religious opinion. But is this so simply because we would all agree on it ? That no distinction in treatment should be made where there is no significant difference is not merely a principle of equity in taxation, but of all morality.

Let us accept the meaningfulness of the distinction between purely fiscal and political taxes (which goes back to the classics), although it conceals some formidable philosophical problems. The postulate of a ' purely fiscal ' tax would require the following assumptions :

1. The incidence of this initially equitable tax must at no stage have discriminatory effects.

2. The distribution of income and property, the efficiency of production and the composition of output must be either (*a*) correct and in no way changed by the tax, or (*b*) if incorrect or, although correct, changed, it must be the case that the corrections are better made by other means than taxation.

But assumption (1) is impossible for all taxes except those on pure surplus, assumption 2 (*a*) is clearly false, and 2 (*b*) at best questionable. The Commission argue 2 (*b*). Wicksell brought out clearly the need for assumption 2 (*a*), though he concentrated in classical fashion on distribution :

> ' . . . justice of taxation presupposes tacitly a just distribution of income and property, from whichever point of view the problem is judged. Otherwise it would not make sense to speak of equality of service and counterservice or of equality of sacrifice.' (Wicksell, *Finanztheoretische Untersuchungen*).

As Wicksell says in another place, to base a fair tax system on an unfair property system is an attempt to take a fair share out of an unfair whole.

To-day, however, the redistributive aims of taxation are widely accepted as just.[1] The thing the business men kick against are discriminatory investment and initial allowances. Yet the argument is exactly parallel. Given

[1] That they are not generally so accepted may be seen from the memorandum of the A.B.C.C., Day 5, section 5, where they attribute poverty to misfortune or laziness, and wealth to energy and creativeness.

certain desirable objectives, one must show either that they are attained without the tax, or that other weapons are more suitable. Otherwise to neglect the pursuit of these objectives is incompatible with the claim for equity. In the absence of assumptions 2 (*a*) and (*b*) it is impossible to isolate a purely fiscal tax from a political one.

It appears therefore that:

1. a ' purely fiscal ' tax system is either meaningless, or, if meaningful, so vague and formal as to yield little practical guidance;

2. even if one could give precise meaning to it, such a system would presuppose at least one of the following conditions:
   (*a*) an existing ideal income distribution and production pattern, in the absence of any tax, and unaffected by the ' purely fiscal ' tax;
   (*b*) remedies of injustices and inefficiencies in existence or caused by the tax by other means—in which case it would have to be shown why these are preferable;
   (*c*) a separate tax system, pursuing the social, political, and economic objectives, upon which the ' purely fiscal ' system is superimposed.

2 (*a*) seems to be implicitly assumed by the business world,[1] 2 (*b*) by the Commission (418), and 2 (*c*) by economists like Wicksell and Lindahl. The business men, however, are not altogether consistent in abhorring taxation as an instrument of economic policy: they favour it, if it favours them. Thus Mr. Chambers, after having rejected initial allowances on the ground that taxes should serve ' purely fiscal ' ends (whatever that may mean), proposes discrimination in favour of companies operating abroad, to promote competitiveness. (Day 4, 1061). He advocates that profits not remitted to the U.K. should be untaxed. 2 (*b*) is defensible in principle, but it is not clear why direct controls, monetary controls, or indirect taxes are more suitable vehicles of economic policy.

Finally 2 (*c*), theoretically the most attractive solution, breaks down because we already have a complex tax system with numerous economic and political consequences. If we postulate that the correct incentives to production and the fair income distribution are achieved *after* tax, the argument is circular. *Any* tax which brings this about is, *ex hypothesi*, one of the causes of the desired situation. But if the assumption refers to the pre-tax situation, as it must in order to be interesting, the difficulty is that the actual situation is the result of both political and fiscal taxation. It is thus impossible to superimpose a system of purely fiscal taxation upon one of political taxation, for ' fiscal ' taxation is partly responsible for the actual situation.[2]

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[1] *E.g.* Mr. Bower, Day 16, 4252: Chairman: But if you are approaching this from the point of view that it is greatly in the public interest that some assistance should be given to this problem of finding the money for new assets, it is not impossible for Governments to distinguish between the importance in the national economy of one industry rather than another, is it? Why should it be impossible in this connection? Mr. Bower: I should say taxation is not the right instrument to use, it is a bad instrument. It is capricious in its incidence. It does not happen at all if there are no profits, and *the ordinary price mechanism is the best way to deal with it.*

[2] See G. Myrdal, *The Political Element in the Development of Economic Theory*, p. 183.

There is, however, a more convincing line of argument against discrimination. Mr. Bower objects to initial allowances partly because he thinks that if things are left to themselves they produce better results (see above 2 (*a*)), but partly because, in his view, the government is *unable* to discriminate in the public interest.

> ' What criterion can one adopt ? If you say the making of toys is quite useless, why should that be stimulated, on the other hand it might be an excellent export in competition with German toys which used to be sold pre-war. That is an example, but it would run through all the various industries, and nobody can say which is the winner in the future.' (Day 16, 4249).

The objection here is not to the aim of discrimination, but to its unintended effects. This is a powerful argument against taxation as a weapon of policy (and in favour of the careful collection and study of facts and incidence) but it inevitably applies with equal force to ' purely fiscal ' taxation. Even an apparently ' purely fiscal ', non-discriminatory, tax will in its effects discriminate in some way.

Two questions arise : (1) What is meant by ' equity ', and (2) to what extent should equity be sacrificed in favour of other social or economic objectives ?

The meaning of ' equity '. With the abandonment of interpersonal comparisons of utility, the debate on the Principles of Taxation was effectively killed.[1] Nevertheless, a good deal of ' unconsciously implicit utilitarianism ' (in Sidgwick's phrase) lingered on. The absence of explicit discussion of the principles did not help the clarification of the nebulous concept of Equity.

Edgeworth, who, of course, was still brazenly utilitarian, insisted on interpreting equity as equal *marginal* sacrifice. Only if the marginal disutility of taxation is the same for all is total sacrifice minimised and the greatest happiness achieved. This requires—on the usual assumption of equal capacity for happiness—equality of income—at least down to the level at which total tax receipts equal pre-arranged total revenue. But clearly Edgeworth could not rest there : ' The *acme* of socialism is thus for a moment sighted; but it is immediately clouded over by doubts and reservations.'[2]

Arguments as to the diminution of total product, of liberty, etc., limit the revolutionary principle. Thus in practice his position is not so different from other interpreters of equity[3] who claim it to imply either *equal sacrifice* (*i.e.*

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[1] It would seem logically possible for a cardinalist who rejects interpersonal comparisons to retain the principle of equi-proportional sacrifice, but not those of equal or minimum sacrifice.

[2] *Papers Relating to Political Economy*, Vol. II, p. 104. Similarly, Second Report of the R.C., para. 105–106. The Commissioners are more self-conscious utilitarians ; *ibid*, 106.

[3] ' This levelling principle requires to be corrected by several prudential considerations. There is the danger of driving the rich, or at least their riches, from the country, and checking accumulation ; there is the danger of awakening the predatory instinct of the poor, and precipitating revolution. When tempered by ordinary prudence, the suggested rules of equity deduced from the principle of *least* sacrifice are not, in practice, very different from the received rules which are deduced from the principle of *equal* sacrifice.' *Op. cit.*, pp. 130–131. ' The large relief from the burden of taxation which *prima facie* on distributional grounds should be afforded to the less prosperous, is restricted by the productional principle that those who have a share in calling the tune should have a share in paying the piper.' *Op. cit.*, pp. 159 and 241.

equal *total* sacrifice for each) or *equal proportional sacrifice*. Both these latter principles involve larger total sacrifice, but this has to be accepted, by the utilitarian, in the interests of production and social peace. Basing equity on sacrifice may lead to three politically very different conclusions : equal sacrifice is the most conservative, proportional sacrifice somewhat more radical, and minimum sacrifice (equal marginal sacrifice) the most revolutionary. But there are other Principles which could equally claim to be the basis of Equity : the Principle of Benefit, the Principle of Ability or Faculty, etc.

Mill, Sidgwick and Edgeworth limited the application of the greatest happiness principle—their interpretation of equity—by considerations of political prudence and productive efficiency. They believed in laissez-faire in the sphere of production, however revolutionary their views in relation to distribution. Their productional conservatism mitigated their distributional radicalism. But with the loss of faith in laissez-faire in the field of production, a simple extension of their argument suggests itself. If they could justify a system of taxation which violated the canons of equity in the interests of production (conducted under laissez-faire), then a tax which fosters production is also justified, at least up to a point, even if it violates equity. And by an extension of the Marshallian argument that more production in the long run reduces injustice and hardships, such a tax, though inequitable on a short-run view, could even be justified on grounds of equity.[1] It thus appears that in spite of the indignation of many witnesses, the case for the initial and investment allowances can be made out on strictly classical lines.

So far we have, following Mill, Sidgwick and Edgeworth, identified equity with justice. Yet the two are not the same. An unjust situation can be remedied in an equitable and in an inequitable way. Thus one might argue that, even though existing conditions are unjust, it is yet possible and, indeed, desirable to have a ' purely fiscal ' tax system if that means an equitable one. It is just that criminals should be punished, but it would be inequitable, or unfair, to punish red-haired criminals only. And if it were impossible to punish some, it could be argued that none ought to be punished on grounds of equity, although this would not be just. Similarly, it may be unjust for some to be excessively rich, but it would be inequitable to tax every third man who enters the Ritz. Only a greatly elaborated and emaciated Greatest Happiness Principle could incorporate this type of difficulty. Granted an ideal of social justice, the choice still remains of getting nearer to it inequitably, or staying further away from it equitably.[2]

Related but distinct is another point : there is an element of respect for vested interests and for ' legitimate expectations ' (even though anti-social and unjust) in the use of the concept ' equity' . This is recognised by the Commission : ' It is always possible to label as discriminatory a process which merely aims at restoring uniformity through the removal of a dis crimination at some earlier date,' (554). But at least in this connection the Commission reject this argument.

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[1] See below 361.

[2] Nicholson pointed out that Edgeworth's principle of minimum sacrifice conflicts with formal justice, which requires equal sacrifice. *Principles of Political Economy*, para. 4, note.

As long as there is consent on what is equitable all is well. But if a dispute arises I doubt whether objective rules can be discovered for its resolution.[1] But even in the absence of clear-cut rules, distinctions may still be drawable, and even when agreement on what is equitable may not be reached, in a particular case, agreement might be reached on what kind of consideration would be relevant.

But at times the Commission argue more realistically, or more cynically, that what matters is not so much equity as a general belief that the system is equitable. (416, Second Report, 107). This may raise the question, is it better to foster ' the reputation for fairness and impartiality ' of an inequitable system, or to face erroneous popular distrust of an equitable one ? This dilemma might be resolved, if we define, circularly, ' equity ' as that which is generally considered equitable. But the Minority's view shows the existence of ' a fundamental difference of view between ourselves and the Majority as to the basic requirements of an equitable system of income taxation '. (M.D. 1) The belief of the general public in the equity of the system appears to rest, not on false ideas of equity, but on an ignorance of the extent to which some people can avoid paying what, in equity, they should. If public opinion begins to resent the facts presented by the Minority as unfair, and to lose faith in the equity of the system, would the Majority advocate reform ?

Equity and rival aims. Equity is generally treated not as an absolute good but as, partly, expendable and subject to ' more or less '. *Fiat iustitia pereat mundus* could not be said of justice's gentler sister. Such rival claims may be incentives, or economic progress. An adaptation of indifference curve analysis can be used to show how, in societies with different valuations of relative merits of equity and incentives, their optimum combination is found for a given level of administrative costs. The indifference curve field can be used to illustrate different political and sociological constellations. Thus a welfare society under the pressure of votes and public opinion, may be ready to sacrifice a good deal of incentive to equity. This emerged quite clearly in the interrogation of witnesses on the possibility of taxing ' standard ' incomes. On the other hand, a totalitarian state can stress incentive at the expense of equity. If the slopes of the opportunity lines are similar to that of the indifference curves, a wide range of alternatives is open, and, if there are political differences over the preference field, disputes and clashes over the merits of equity and incentive will be frequent. Anything that widens opportunities without raising administrative costs will improve the range of choice. This may be done by tax devices such as averaging over time or concentrating on surplus, or by changing the psychology of human beings, so that they require smaller rewards for their activities, or so that they change their ideas of what is equitable.

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[1] In a sense this was recognised by Mill and Edgeworth : ' To be incapable of proof by reasoning is common to all first principles.' *Utilitarianism*, p. 52, and quoted with approval by Edgeworth, *op. cit.*, p. 235.

The problem is complicated if Equity and Incentive are considered to be interdependent. This seems to have been Marshall's view in his evidence before the Royal Commission on Local Taxation (1899):

> 'Even in the interests of equity canons based on mere considerations of equity are often of but secondary importance in practice. Speaking generally, those systems of finance have caused the least injustice and hardship which have most favoured the development of the energies and inventiveness of the people, which have hindered them the least in the selection of those routes for the satisfaction of their wants.'

OUTPUT, EMPLOYMENT, AND PRODUCTIVITY IN BRITISH MANUFACTURING IN THE LAST HALF CENTURY

By A. MADDISON

The aim of this paper is to describe the growth of output, employment, and productivity in the major sectors of British manufacturing industry in the period since 1907. In the United Kingdom, long term production measures for the manufacturing sector alone are practically non-existent, output in manufacturing having been in most cases aggregated with mining, quarrying, gas, electricity, water, and construction in indices of industrial output. In the United States, the index for manufacturing has been more common, and indices of industrial output seldom include building. The separation of the manufacturing sector in the United Kingdom is, however, extremely useful, for the trend of output and productivity in British manufacturing has been completely different from that in mining over the last fifty years, while in the case of building the problems of measuring output are much greater.

I

Although indices of production can be constructed from material from various sources, by far the most satisfactory are those which are based on the raw material contained in industrial censuses. This is true *a fortiori* of indices of productivity, because the industrial census is practically the only source from which we can be sure of getting data on output and employment on a comparable basis. In the United Kingdom, industrial censuses have been taken at fairly infrequent intervals, but nevertheless they extend back to 1907[1] and provide a more plentiful supply of reliable information on industry for a longer period than is available in most other countries. The material in the British censuses of production has never been systematically exploited to construct production and productivity indices on a consistent basis covering several decades as has been done by Professor Fabricant in the United States.[2] Some use has, of course, been made of the census material in constructing indices of production, but there have not been many of these benchmark indices. The outstanding attempts of this character in the past have been the indices of Professors Tolles and Douglas[3] for the period 1907–1924, Professor Devons '[4] index for 1924–1935, and Mr. Brown's[5] for 1935–1948.

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[1] The first British industrial census was in 1907, and there were complete censuses in 1924, 1930, 1935, and 1948. There was a partial census in 1912, and the import duties inquiries for 1933, 1934, and 1937 contained data similar to that in the census for a large part of industry.

[2] S. Fabricant, *The Output of Manufacturing Industries, 1899–1937*, N.B.E.R., 1940, New York, and *Employment in Manufacturing, 1899–1939*, N.B.E.R., 1942, New York.

[3] N. A. Tolles and Paul H. Douglas 'A Measurement of British Industrial Production,' *The Journal of Political Economy*, February 1930, pp. 1–28.

[4] E. Devons ' Production Trends in the United Kingdom,' *The Manchester School*, Vol. X, No. 1, 1939, pp. 55–61.

[5] B. C. Brown, *Industrial Production in 1935 and 1948*, a reprint with a technical appendix of an article in the *London and Cambridge Economic Service*, December, 1954.

However, Mr. Brown is the only one of these investigators to have operated with final census data, Tolles and Douglas having worked with the preliminary results of the 1924 census and Professor Devons largely with the preliminary results of the 1935 census. Apart from their use of incomplete data, these investigations differed in industrial classification and coverage and employed different methods, so that it is not possible to link them without making considerable adjustments.

There have already been attempts to construct long term production measures by using these indices as benchmarks, but these previous attempts have not paid very close attention to the comparability of the series being linked. The most satisfactory of the hitherto existing long term output measures for the main branches of British manufacturing are those of Messrs. Carter, Reddaway, and Stone, who have linked the Tolles-Douglas and Devons' indices with their own index after adjusting the Devons' estimates to conform with the final 1935 census reports, but without any other adjustments.[1] The most recent attempt at a continuous series is that of Mr. Ridley[2] who has used the Tolles-Douglas estimates, but not those of Professor Devons, and Mr. Brown. Mr. Ridley's interest is, however, in the overall figure for industry, and not with the movements in particular sectors of manufacturing on which we have concentrated.[3]

In the present paper we have linked the production estimates of Tolles and Douglas, Devons, and Brown, but only after making considerable adjustments with the help of the original census data. We considered the indices of these writers to be similar enough in basic structure in most cases to make this procedure worth while, but for some branches of manufacturing we felt compelled to construct new indices. It is unlikely that the estimates we have thus derived are substantially less valid than the results we would have obtained if we had decided to ignore the work of previous investigators and undertaken the longer task of calculating production indices completely anew from the basic census material. It will be fairly obvious from our description below that many of the adjustments we have made to the secondary sources would have also to be made to the raw material in the successive censuses. It is inevitable, of course, that there will be discontinuities due to the fact that different investigators have used different indicators of output, e.g. one of them may measure output of linen by weight, and another will measure it by yards. However, changes in the kind of information supplied in successive censuses create similar problems, even when the index is being made for the whole period by a single investigator. The census volumes contain retrospective data from previous censuses which are rearranged to facilitate intertemporal comparison ; thus the 1924 census contains retrospective data for 1907, the 1935 census contains data for 1924 and 1930, and the 1948 census contains data for 1935. There are many cases, therefore, where an investigator using the census material who wished to compare the output of an industry in 1948 with that of 1907 would be forced to arrive at his estimate by comparing first 1924 with 1907, 1935 with 1924, and 1948 with 1935, and then linking these estimates, just as we have done.

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[1] *Cf.* C. F. Carter, W. B. Reddaway, and Richard Stone, *The Measurement of Production Movements*, C.U.P. 1948, pp. 124–125.

[2] T. M. Ridley, ' Industrial Production in the United Kingdom, 1900–1953,' *Economica*, February 1955.

[3] There have, of course, been attempts to construct long term production indices without using the census material as benchmarks at all. The most ambitious of these is the index of Professor W. Hoffmann for the period 1700–1950, which is derived to a very large extent from data on raw materials and imports, cf. *British Industry 1700–1950*, translated by W. H. Chaloner and W. O. Henderson, Blackwell, Oxford, 1955. Hoffmann's method of dealing with those parts of output for which he has no quantity data is similar to that of Tolles and Douglas which we describe below. However, the proportion of output for which he had quantitative data was considerably lower than in the Tolles-Douglas index, and changed to a greater extent over time.

Fortunately, each of the studies we have used aimed at constructing basically the same type of production index. This index is intended to show changes in the flow of net output valued at constant prices. Net output is the difference between the sales value (*ex* works) of output, and the value of materials and fuel used as inputs in the production process. However, in practice, the index measures the true changes in net output only approximately, because the basic indicators of production movements actually used are *physical* measures, such as tons of steel, pounds of sugar, or barrels of beer.[1] The index, therefore, relies on the assumption that the changes in these basic physical indicators give a reasonably good indication of corresponding movements in net output.[2]

The census reports are based on returns made by industrial establishments and the basic census classification of establishments is into ' trades.' Most trades produce fairly homogeneous products but very many of them produce more than one type of commodity. In such cases, the indicator of output movements for a trade is itself a weighted aggregate. However, the census does not give information on the value of net output *within* trades ; *e.g.*, in the boot and shoe industry, we know the number of men's and women's shoes produced and we know their value, but we do not know what proportion of the raw materials consumed by the trade goes into men's and women's shoes respectively. Therefore we have to weight the individual output indicators, *i.e.*, the number of pairs of men's and women's shoes produced, according to their respective sales value *ex* works in the base year in order to produce an output index for the boot and shoe trade. However, when this index for the boot and shoe trade is subsequently combined with those for other trades to form the index for the clothing group, it is given a weight corresponding to the net value (i.e. sales value less the cost of materials and fuel) of its output in the base year.

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[1] With one exception—Mr. Brown's indicator for the motor vehicle and cycle industry—which measured the volume of net output (production at constant prices, less materials used at constant prices).

[2] Over long periods there may be considerable changes in the input-output structure of an industry, so that a physical measure of output—which really measures gross output—may misrepresent the growth of net output, *e.g.*, if tons of steel are used to measure output in the primary iron and steel trades, and the steel industry switches to using imported scrap instead of making its own pig iron, the growth of net output will be overstated. This danger of misrepresentation can be minimised, but not overcome, by having separate indicators of output for as many trades and commodities as possible, e.g. by having separate indicators for pig iron and the different kinds of steel, as is the case in our indices. There may, of course, be some compensations because the ratio of input to output may increase in some trades and diminish in others.

One of the biggest problems in making production indices arises in the case of those activities for which the census gives no quantitative data on output. One way of tackling this problem is to assume that the output movements of other commodities within a trade, or of related trades within a manufacturing group, for which there are quantitative data, are also representative of those for which such information is lacking. Another method is to assume that productivity is constant and to use employment as an indicator of output movements. A third procedure is to deflate the value of output of those activities for which no quantitative figures are available by a price (average value) index derived from the value and quantity data available for related trades or commodities. The third procedure seems preferable[1] to the first because the price movements of related commodities are more likely to be uniform than their output movements ; and it also seems preferable to the second because it would be purely fortuitous if productivity happened to remain constant in those activities for which data were lacking on output. The third method was used by Devons and to a large extent by Brown ; but Tolles and Douglas used mainly the first procedure, and Brown made some use of employment indicators. These are the only major points on which there is a substantial difference in method between Tolles and Douglas, Devons and Brown, and we have tried to eliminate these descripancies by recalculating some of the Tolles-Douglas and Brown indices.

We have used our production estimates as a basis for calculating productivity movements. As far as we know, no previous investigator has attempted to estimate labour productivity movements in particular branches of British manufacturing for the whole of the period we cover.[2] Labour productivity can be measured in several different ways. We have preferred to relate output to the labour time of all employees rather than to that of wage earners alone, because there have been fairly big changes in the proportion of salaried workers in the period under review, and there have also been some changes in the census definition of wage earners but not of employment as a whole. The employment figures therefore cover all wage and salary earners and working proprietors, and exclude only outworkers. Our estimates of output per employee have a high degree of accuracy because the data on output and employment are derived from exactly the same source, and are identical in coverage and classification. However, there were big changes in working hours during the period under review, and for this reason estimates of output per employee hour are for many purposes more interesting than those of output per employee. Unfortunately, the censuses do not give information on working hours. However, with the reservations noted later, it seemed to us that the data on working hours of the Ministry of Labour were comparable enough in coverage and classification to be used with our figures on output and employment in estimating changes in output per employee hour.

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[1] *Cf.* chapter 2 of *Indexes of Production, Census of Manufactures : 1947*, U.S. Department of Commerce, Bureau of the Census, 1952, which discusses several other methods of assessing the output of commodities or trades for which the census gives no quantitative data.

[2] Dr. Rostas presented some estimates of output per *wage earner* hour for industry as a whole for the period 1907–1937 but they were derived from the unadjusted Tolles and Douglas, and Devons estimates ; *cf. Comparative Productivity in British and American Industry*, C.U.P., 1948, Chapter IV.

The following three sections describe in detail the adjustments we have made to the production estimates of Tolles and Douglas, Devons and Brown. In the fifth section we describe the procedure by which we have linked the production estimates for the three sub-periods into a continuous production series for the whole period 1907–1948. The sixth section deals with our productivity estimates, and in the final section we comment on the long run movements. The appendix shows the extent to which our estimates are consistent in scope and classification over the whole period.

II

1907–1924

For the period 1907 to 1924 we have used the estimates of Tolles and Douglas with a considerable number of adjustments. However, we have calculated completely new indices of production for about 40 per cent of manufacturing output because in several cases we felt that the Tolles-Douglas indices were too unsatisfactory to be used for our purposes even after adjustment, either because of the methodological reasons mentioned below, or because their classification of trades between groups differed from that adopted for later years.

We have calculated new indices for the iron and steel group, and the engineering, shipbuilding, and vehicles group, because there was a substantial divergence in the growth of output between these two groups which is masked by the Tolles-Douglas estimate for the two groups combined. We have not thought it worth while to calculate separate indices for textiles and clothing, but it seems likely that the output movements of these groups were similar between the two years 1907 and 1924.

The Tolles-Douglas estimates were made before any of the final 1924 census reports were published, and the authors relied on preliminary data for 1924. We have therefore adjusted their indices in accordance with the final 1924 census reports. This was done by multiplying their estimates for each industry group by the ratio of the value of net output recorded in the final 1924 reports to that in the preliminary reports. As the preliminary reports used by Tolles-Douglas covered Great Britain and excluded Northern Ireland, whereas the final reports covered the whole of the United Kingdom, our adjustment had the effect of broadening the geographical scope of their index. Tolles and Douglas are not at all clear on this question of geography and in some places they seem to imply that their index covers the U.K. as it was in 1924, i.e. Great Britain and Northern Ireland.[1] In fact, however, their index covers Great Britain in 1924, and Great Britain plus a few Irish industries in 1907.

It is not possible to separate in the 1907 census the data for Northern and Southern Ireland, or even to separate neatly Ireland as a whole from Great Britain.[2] No comparison can therefore be made between 1907 and 1924 in which the area covered will be identical. One has to choose between the Tolles-Douglas comparison of Great Britain in 1924 with Great Britain plus an untidy, unsegregable patch of Irish industry in 1907, or a comparison of the United Kingdom in 1924 with the geographically bigger United Kingdom of 1907. We have chosen the latter,[3] because this coincides with the scope of the final census reports, and it is convenient in some respects to have an index which refers to the administrative boundaries of the country. Our production index for total manufacturing is probably about 2.4 per cent smaller than it would be if it had been calculated on a Great Britain basis.[4] The productivity index is, however, only about half a per cent smaller than it would be on a Great Britain basis.

As a weighting system, Tolles and Douglas used the net value added as recorded by the census for individual trades, and within trades they used sales values (*ex* works) as weights for individual products, *i.e.* the method followed by later investigators. However, in the case of brewing and malting, and sugar, they included excise duties in the weights for these trades and thus gave them a disproportionately large influence in the food, drink, and tobacco group. We have therefore recalculated their index for the food, drink and tobacco group giving brewing and malting, and sugar weights net of excise duty.

Unlike Devons and Brown, Tolles and Douglas did not make any systematic adjustment to their production estimates to deal with commodities for which they had no quantitative indicators of output. For some trades they used price indices to deflate the value of output, but in most cases where they had measures of output for the greater part of a trade or group of trades, they simply assumed that output in the ' uncovered ' sections moved *pari passu* with that in those sections for which they had quantitative measures. If the proportion of output in these ' uncovered ' sections were very small, the difference between the Tolles-Douglas procedure and that of Devons and Brown would not matter very much. Even if the ' uncovered ' proportion were fairly large, the difference in procedure would not affect the results if the Tolles-Douglas coverage, *i.e.*, the proportion of output by value for which they had quantitative indicators, were the same in 1907 and 1924.[1]

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[1] Tolles and Douglas used only volumes 1–30 of the preliminary reports of the 1924 Census (*cf. op. cit.* p. 2, footnote 5) which related to Great Britain. They state erroneously that the subsequent preliminary census reports on Northern Ireland merely tabulated separtely results already included in the 30 reports they used (*cf. op. cit.* p. 16, footnote 41). Also they did not make use of the 31st report which dealt with government departments.

[2] In some industries, Irish output was of such very minor importance that it was not given separately and in others the separation of Irish figures would have encroached on the secrecy of the census about particular establishments—the latter reason being relevant to the tobacco industry, some cotton manufactures, and household furnishing.

[3] This choice involved two adjustments to the Tolles-Douglas index, which are described in the notes to Table I.

[4] In 1907, Ireland was responsible for about 4 per cent of United Kingdom manufacturing net output, and in 1924, Northern Ireland produced about 1.7 per cent of United Kingdom net output. These proportions varied among the different industry groups ; *cf.* note 1 to Table I.

Tolles and Douglas claimed that their production index was based on a coverage of about 79 per cent of the value of industrial output recorded by the census. They also suggested that this ratio was almost identical in 1907. However, they do not show the size of their coverage for 1907, and if in some groups the coverage was greater in 1924 than in 1907, their index would tend to overstate the increase in production. The employment figures of Tolles and Douglas are rather curious and suggest that their coverage did in fact extend to a greater proportion of output in 1924 than in 1907. They give a table showing the number of persons employed in 1907 and in 1924 in ' the identical establishments measured by our index of production.'[2] These figures are much smaller than those in the census returns, and it must be assumed that they represent not total employment but employment in the firms which they covered. The figure they give for 1924 for all persons employed is about 79 per cent of the figure given by the 1924 preliminary census reports, *i.e.* it bears the same relation to the total as does their coverage in terms of value. However, the figure they give for 1907 is a slightly smaller proportion of the total number employed in that year, namely about 76 per cent.[3]

Thus one is led to suspect that the production index of Tolles and Douglas would have been lower by perhaps 3–4 per cent if it had been systematically calculated by the methods used later by Devons and Brown. However, the ' error ' was not evenly spread among the original Tolles-Douglas indices, but was concentrated in the indices for the non-ferrous metals and miscellaneous groups where the coverage was low and changed considerably between 1907 and 1924. We have therefore recalculated the indices for these groups from the original census data, using the same method as Devons and Brown. We have also recalculated the index for the leather group, in which the Tolles–Douglas coverage was low, so that the remaining upward bias in our adjusted estimate for manufacturing which is due to the Tolles-Douglas procedure is negligible—probably only about half of one per cent.

The censuses of 1907 and 1924 theoretically covered all firms in the United Kingdom. However, most people working on their own account and in family enterprises, and some working in small workshops were excluded. The 1907 census[4] contains an estimate of the number of people employed in industries within the scope of the census who were not in fact covered by it. The estimate of the number excluded was made by comparing employment recorded in the production census of 1907 with a fairly simple extrapolation of the numbers who reported themselves occupied in the same industries in the 1901 population census. It was estimated, after adjusting the population census figures for old age, unemployment, and misclassification, that 1 to 1¼ million persons with a net output of about £50 million had been excluded from the production census, as compared with roughly 7¼ million whose output was recorded. No breakdown of the excluded persons is given, but it is said that they were mainly in the clothing, boot and shoe, laundry, and building trades. These figures refer to the whole field covered by the census, of which only two thirds by value consisted of manufactures. The coverage of the census for manufactures was, however, higher than these figures suggest.

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[1] *Cf.* S. Fabricant, *Output of Manufacturing Industries*, p. 362–7 for a fuller discussion of this topic.

[2] *Op. cit.*, p. 12.

[3] The impression that their sample increased between 1907 and 1924 is strengthened by the table which they give showing the changes in employment between 1907 and 1924 as index numbers for individual industry groups. These indices show bigger increases in employment than those shown by the preliminary 1924 census reports in almost every case except food, drink and tobacco, and paper, printing, and publishing.

[4] *Final Report of the First Census of Production of the U.K.* (*1907*), p. *iv*, H.M.S.O., 1912.

In the first place, the 1907 census included in the estimate of the uncovered section a generous allowance for people who were engaged in census trades but whose output consisted of services rather than manufacturing, *e.g.* shoe repairing. Such workers were also theoretically included in later censuses, and also in many cases failed to make returns, but the later census takers seem to have estimated their number more conservatively. Secondly, the number of people excluded from the census was proportionately much higher in the non-manufacturing trades, such as building and laundry work,[1] than in the manufacturing trades.

It seems reasonable to assume that about 0.4 million people employed in manufacturing with a net output of £25 million were excluded from the 1907 census. The census therefore understated 1907 manufacturing output by about 5 per cent and employment by about 8 per cent. In 1924 the number of persons employed by firms not making returns was about 3.1 per cent[2] of those reported in the census, and these firms produced about 2.2 per cent[3] of the value of output recorded by the census. Since the proportion of firms omitted from the census was larger in 1907 than in 1924, our production indices overstate the increase in output to a small extent. Our production index for manufacturing as a whole rose 32.6 per cent from 1907 to 1924, with 1907 weights, and 21.3 per cent with 1924 weights ; if all small firms had been included, these figures would probably have been 29.3 and 18.3 respectively. On the other hand, our estimates of the rise in output per man, *i.e.* 20.6 per cent with 1907 weights, and of output per man hour, *i.e.* 42 per cent with 1907 weights, for manufacturing as a whole, are too low, and would

[1] The 1901 population census reports well over a million people occupied in building trades, and the 1907 production census just over half a million ; in the laundry trade the respective figures are 205,000 and 132,000

[2] *I.e.* the difference between the number recorded in the 1924 Final Census reports, and the retrospective data on 1924 published in the 1935 census which included estimates for employment in firms not covered by the census. (The difference between the figures in columns 2 and 3 of table X is slightly bigger than this because the 1924–1935 data have a very slightly bigger coverage, cf. notes 7 and 8 to table X).

[3] In 1924 the value of net output per head in reporting firms with 10 employees or less was on the average about three-quarters of that in firms with more than ten employees.

TABLE I. *Changes in Manufacturing Output*[1] *1907–1924*

Sector	*Indices with 1907 weights*		*Indices with 1924 weights*	
	1907	*1924*	*1907*	*1924*
Iron and Steel[2]	100.0	118.8	100.0	119.9
Engineering, Shipbuilding and Vehicles[2]	100.0	188.4	100.0	176.5
Non-Ferrous Metals[2]	100.0	102.2	100.0	105.2
Chemicals[3] [4]	100.0	172.7	100.0	154.8
Textiles and Clothing[3]	100.0	100.1	100.0	102.1
Leather[3]	100.0	119.4	100.0	104.7
Food, Drink and Tobacco[5]	100.0	102.6	100.0	90.9
Timber[3]	100.0	108.5	100.0	108.5
Paper, Printing and Publishing[3]	100.0	169.4	100.0	168.4
Clay and Building Materials[3]	100.0	121.1	100.0	116.3
Miscellaneous[2]	100.0	239.9	100.0	260.9
Total[6]	100.0	132.6	100.0	121.3

[1] These estimates refer to the United Kingdom, which included Southern Ireland in 1907 In order to convert them approximately to a G.B. basis, the indices for the separate groups should be multiplied by the following coefficients:
iron and steel 1.004, then in the sequence listed in the table 0.998; 1.015; 1.010; 1.016; 1.000; 1.077; 1.058; 1.032; 1.008; 1.000; and the total by 1.024. The productivity indices (*cf.* tables VI and VIII) for this period would be affected to a negligible extent and much more uniformly—in most cases they should be multiplied by a coefficient of 1.005.

[2] For these groups, we have calculated the production indices directly from the census data, using the Devons' method of coverage adjustment. A substantial part of our index for the engineering group was constructed by deflating the value of net output by 'price' indices derived from census material on steel products.

[3] For these groups, the indices have been derived by multiplying the Tolles-Douglas indices by the following two ratios:

(i) The value of net output in Great Britain plus a few non-segregable Irish industries for 1907 (as recorded retrospectively in the 1924 preliminary census reports), divided by the value of net output in the United Kingdom for 1907 (as recorded in 1907 census).

(ii) The value of net output in the United Kingdom 1924 (as recorded in final 1924 census) divided by the value of net output in Great Britain 1924 (as recorded in the preliminary 1924 census reports).

In addition, we have made certain adjustments to the scope and classification of the Tolles-Douglas indices to bring them into line with those used for later years. We have therefore calculated the manufacturing output of government industrial establishments and have included this with the relevant manufacturing groups. We have omitted laundries from the index for textiles and clothing, but as there were no indicators of physical output available to Tolles-Douglas for this industry, their index did not need adjustment on this score. Similarly, we have omitted building from the Tolles-Douglas index for clay and building materials. We have allocated the cart, carriage, and waggon trades to vehicles, and the brush trade to the miscellaneous group. Tolles and Douglas included the cart, carriage, and waggon trade and the brush trade with the timber group, but as they had no output indicators for these trades (*cf.* Tolles and Douglas, *op. cit.*, pp. 19 and 22) their index for the timber group becomes more, rather than less, acceptable when we exclude these two trades from it. We have adjusted the Tolles-Douglas index for clothing and textiles to include canvas goods and sacks (canvas and sacks were included in the Tolles-Douglas index for leather goods which we have not used.)

[4] Tolles and Douglas included certain products in the chemical industry which were the products of other industries, and they give the industry greater weight than we do. However, they do not appear to have deducted these products elsewhere, so that they did a certain amount of double counting. Nevertheless, their index is accepted because they probably indulged in a similar amount of double counting for 1907 as well.

[5] The Tolles and Douglas indices for this group understated the increase in production by about 6 per cent using 1907 weights, and 7 per cent using 1924 weights, because they were calculated gross of excise duties on sugar and beer, which amounted to £15.3 million in 1907, and £91.6 million in 1924. This led to an exaggeration of the relative importance of the 40 per cent decline in beer production. Our index is, nevertheless, lower than theirs because of the inclusion of Ireland which, in 1907, was responsible for about 8 per cent of the output of the industry compared with Northern Ireland's 1 per cent share in 1924.

[6] The weights used for the total index are the net values shown in columns 1 and 2 of Table IX in the Appendix.

probably have been 23 per cent and 45 per cent respectively if all small firms had been included.

III

1924–1935

The basic estimates for this period are those of Professor Devons.[1] These estimates were made before all the final reports of the 1935 census were published, and the 1935 figures have been adjusted by Carter, Reddaway, and Stone[2] to conform with the final census results by the method which we have applied to the figures of Tolles and Douglas.

However, Devons' index relates only to firms employing more than ten persons, whereas the indices of Tolles and Douglas and of Brown refer to firms of all sizes. We have therefore adjusted the Devons index to cover all firms. This adjustment makes little difference to the index for manufacturing as a whole because the changes in the importance of small firms were slight ; in 1924, small firms employed 10.7 per cent of the number employed in large ones, in 1930 11.7 per cent, and in 1935 10.2 per cent. The size distribution of firms did not, however, change in the same way in all branches of industry, and in clothing, for instance, the firms employing ten persons or less were responsible for about a third of the employment in the industry in 1924, and for only a fifth in 1935, and for this reason, Devons' index for the large firms alone overstates the increase in production for this industry. We have also adjusted Devons' figures to cover the manufacturing activities of government departments.

TABLE II. *Changes in Manufacturing Output*[1] *1924–1935*

Sector	*Indices with 1930 weights*		
	1924	*1930*	*1935*
Iron and Steel	100.0	99.6	124.5
Engineering, Shipbuilding and Vehicles ...	100.0	111.0	144.1
Non-Ferrous Metals	100.0	110.7	132.3
Chemicals	100.0	106.8	128.9
Textiles	100.0	81.5	109.0
Clothing	100.0	106.3	125.2
Leather	100.0	93.9	110.4
Food, Drink and Tobacco	100.0	112.9	126.4
Timber	100.0	133.7	162.3
Paper, Printing and Publishing	100.0	116.0	155.0
Clay and Building Materials	100.0	127.3	176.2
Miscellaneous	100.0	134.4	150.9
Total[2]	100.0	107.0	133.2

[1] The production figures are the Carter, Reddaway and Stone versions of Devons' estimates adjusted by the ratio :

> The value of net output in large firms, government industrial establishments, and small firms (calculated as described in the text) divided by the value of net output in large firms.

for 1935 and 1930 relative to the same ratio for 1924. Large firms are those employing 11 persons and more.

[2] The weights used are the net values of 1930 (*cf.* Appendix, Table IX, column 4).

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[1] E. Devons ' Production Trends in the United Kingdom ', *The Manchester School*, Vol. X, No. 1, 1939, pp. 55–61.

[2] C. F. Carter, W. B. Reddaway and Richard Stone, *The Measurement of Production Movements*, C.U.P. 1948, pp. 124-5.

In 1924 the value of net output per employee in small firms was on the average about three quarters of that in large enterprises. For 1930 and 1935 the information on small firms relates only to employment, but we have assumed that for these years the value of net output per head in the different branches of manufacturing bore the same relation to that in large firms as it did in 1924.

IV

1935–1948

For this period the basic estimates are those of Mr. B. C. Brown[1] which were derived from the 1948 census and refer to Great Britain, as this census did not include Northern Ireland. In fact manufacturing output increased faster in Northern Ireland than in Great Britain in this period, but the inclusion of Northern Ireland would probably not have raised the overall production index for manufacturing by more than 0.3 per cent.[2]

TABLE III

Changes in Manufacturing Output, 1935–1948

Sector	*Indices with 1935 weights*[1]		*Indices with 1948 weights*[2]	
	1935	*1948*	*1935*	*1948*
Iron and Steel	100.0	152.1	100.0	148.7
Engineering, Shipbuilding and Vehicles ...	100.0	188.6	100.0	187.7
Non-Ferrous Metals	100.0	197.4	100.0	156.6
Chemicals	100.0	182.6	100.0	171.4
Textiles	100.0	100.1	100.0	94.7
Clothing	100.0	75.1	100.0	77.6
Leather	100.0	92.1	100.0	89.5
Food, Drink and Tobacco	100.0	134.3	100.0	125.9
Timber	100.0	86.7	100.0	82.1
Paper, Printing and Publishing	100.0	108.4	100.0	115.2
Clay and Building Materials	100.0	138.7	100.0	125.3
Miscellaneous	100.0	180.3	100.0	163.9
Total	100.0	139.2	100.0	133.1

[1] *Cf.* Table IX, column 6. [2] *Cf.* Table IX, column 7.

Apart from the exclusion of Northern Ireland, the industrial scope of the 1935–48 estimates is the same as that for 1924–1935. In Mr. Brown's original estimates, the output and employment of certain railway establishments are included with the vehicles group. However, railway establishments were not included in the estimates for earlier years because the censuses did not give sufficient detail on the industry to separate manufacturing from other railway activities, such as maintenance of the permanent way. We have therefore excluded output and employment in railway establishments[3] from Mr.

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[1] *Industrial Production in 1935 and 1948. London and Cambridge Economic Service,* December 1954, reprinted with a technical appendix.

[2] In 1935, Northern Ireland accounted for 1.4 per cent of the value of net output of firms included in the census for manufacturing industries in the U.K. In the 1949 census Northern Ireland accounted for 1.7 per cent of net output of firms in the U.K. The proportions for employment were 2.3 per cent in 1935, and 2.4 per cent in 1949. *Cf.* The Final Summary Tables of the 1935 Census, and the *Summary Tables—Part 1* of *Censuses of Production for 1950, 1949 and 1948,* H.M.S.O., 1953.

[3] In 1935 net output in these establishments was £18.8 million, and employment 99.3 thousand, and in 1948 £47.8 million and 119.4 thousand respectively.

Brown's figures, which involved us in recalculating the output of railway carriages, waggons, trams, and locomotives produced outside railway establishments. In the case of both locomotives and waggon building the increase in activity was much greater outside than inside railway establishments, and the exclusion raises the production figure for the engineering, shipbuilding, and vehicles group. We have also excluded from Mr. Brown's index the shop and office fitting[1] trade which he includes with the timber group, but which was classified with building and contracting in earlier censuses. The net effect of excluding railway establishments and shop and office fitting, is to raise the production index for total manufactures by half a per cent above Brown's original estimate.

The classification adopted by Mr. Brown is that of the 1948 census, *i.e.* the standard industrial classification. Mr. Brown gives a breakdown of his estimates by trades, so that it is possible to reclassify his data to the same pattern as that for earlier periods. It would have been more desirable to regroup the earlier data according to the standard classification, on which future censuses will be based, but this was not possible because earlier investigators did not give their results in such detail as Mr. Brown. It is not possible to reclassify the data in a way which exactly corresponds with that used for the earlier periods, because the 1948 census reports reclassify the 1935 output of certain firms from one trade to another to a greater extent than was done with retrospective data in earlier censuses; and these reclassifications between trades sometimes pass the boundaries of the broad industry groups we have defined. However, this problem is a minor one and it does not seriously affect the validity of the comparison with earlier years.[2]

Mr. Brown's method for including small firms was different from that which we have used for the period 1924–1935. Since the 1948 census gives no data on the value of output in small firms but gives information on employment, Mr. Brown has assumed that the value of output per employee in small firms was the same as that in large firms ; whereas we assumed that the value of output per head in small firms in 1930 and 1935 bore the same ratio to that in large firms as it had in 1924 (which on the average was about three-quarters).

There was, however, a remarkable fall in the proportion employed in small firms in the period 1935–1948, as can be seen from Table IV. In 1935 small firms employed 10.2 per cent of the number employed in large firms as compared with only 6.4 per cent in 1948. This fall took place in every branch of industry except textiles, where in any case the relative importance of such employment was negligible. Mr. Brown's treatment of the output of small firms probably gives them a heavier weight in the index than they deserve. If he had used the same assumption as we have about output per head in small firms, the production and productivity indices would have been

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[1] In 1935, net output in this trade was £4.8 million (Mr. Brown's estimate) and employment 18.4 thousand ; and in 1948 £9.1 million and 15.45 thousand.

[2] *Cf.* notes to tables IX and X in the Appendix.

TABLE IV

Employment in Small Firms as a percentage of Employment in large Firms[1]

Sector	*1924*	*1930*	*1935*	*1948*
Iron and Steel	8.2	7.5	5.9	4.6
Engineering, Shipbuilding and Vehicles ...	8.0	9.3	8.8	2.8
Non-Ferrous Metals	12.5	13.8	10.1	5.6
Chemicals	5.7	6.4	6.0	3.6
Textiles	1.3	1.7	1.4	1.7
Clothing	31.3	27.5	20.2	11.9
Leather	14.9	16.7	13.9	11.0
Food, Drink and Tobacco...	22.7	23.6	21.6	19.9
Timber	38.0	42.6	35.3	23.2
Paper, Printing, and Publishing	8.7	8.9	8.0	6.7
Clay and Building Materials	5.2	7.3	7.1	6.0
Miscellaneous	7.4	8.5	7.5	5.8
Total	10.7	11.7	10.2	6.4

Source : Estimates for 1924, 1930, and 1935 are derived from data given in the Final Summary Tables of the 1935 Census, with the exception that data on small and non-reporting firms in 1930 were taken from the *Annual Abstract of Statistics*, No. 84, 1935–46, p. 124, which gives figures (presumably corrections) very slightly smaller than those in the 1935 Census. The 1948 estimates were derived from the individual industry volumes of the 1948 census.

[1] ' Small firms ' includes those employing 10 persons or less, and estimated employment in firms not making census returns. In the case of Northern Ireland, small firms are those employing 5 persons or less We have included all the industrial establishments of government departments in the category of 'large firms', *i.e.* those employing 11 persons or more.

slightly higher. For manufacturing as a whole the index with 1935 weights would be 140.7 instead of 139.2, and in some industry groups the effect would be slightly bigger ; *e.g.*, the index for clothing would probably be two points higher.

Mr. Brown's procedure for dealing with those parts of the output of trades for which no quantity indicators were available was similar to that of Professor Devons ; *i.e.* he deflated the value of this section of output by price indices derived from the portion for which both value and quantity data were available. However, there are sometimes no quantity data at all for the output of a trade. In several such cases, Mr. Brown used employment as an indicator of output movements, whereas Professor Devons would have used a price index derived from data for a related trade or group of trades within the same manufacturing group. Mr. Brown used simple employment indicators for trades which produced 12.6 per cent of the net value of manufacturing output in 1935, and 11. 4 per cent in 1948. In order to enhance the comparability of the estimates for 1935–48 with those for earlier years, we recalculated Mr. Brown's production indices for these trades. We used a procedure similar to that of Professor Devons, except for the newspaper printing and publishing, and the book printing and publishing trades. As these trades together produced more than two thirds of the net output of the paper printing and publishing group, it seemed a little dangerous to assume parallelism of ' price ' movements and we assumed instead that output per man in these trades changed in the same degree as in the rest of the group to which they belonged.

V

1907–1948

In order to construct a long term series for the period 1907 to 1948 we have linked the production relatives for the periods 1907–24, 1924–35, and 1935–48, which we have described above.

The methodological differences between the different investigators whose indices we have adjusted and linked are not so large as to create appreciable conceptual discontinuities in the long term series. We have eliminated the most important difference, which arose in dealing with activities for which quantitative indicators were lacking, and the only major methodological problem which remains is that of weighting.

Both the Tolles-Douglas and the Brown estimates show output on alternative bases using different weighting systems. Our production index for total manufacturing for 1924 (1907 = 100) is 9.3 per cent higher with 1907 weights than it is with 1924 weights ; for 1948 (1935 = 100) it is 4.6 per cent higher with 1935 weights than with 1948 weights. This difference is due to the tendency for productivity to rise most quickly in industries where output is expanding fastest, which often leads to a reduction in relative costs and prices in these lines, so that they are given a smaller weight by the end prices of a period than by the starting prices.

For the period 1924 to 1935, we have no alternative weighting system, since Professor Devons' estimates were based only on 1930 weights. However, in this particular case, the normal tendencies were counteracted by the large absolute and relative price fall in the important textile group, where output rose much less than in the other major groups between 1924 and 1935. There is, therefore, reason to believe that our production index for total manufacturing with 1930 weights does not differ substantially from, and is probably slightly higher than, the alternative indices which might have been constructed with either 1924 or 1935 weights, although the indices for individual groups would have differed to a greater extent.[1]

Tolles and Douglas and Brown chose to state their results in terms of the geometric averages of their alternative production figures. We have, however, preferred to use a simpler weighting system. We have linked our production relatives with 1907 weights for 1907–24 to those with 1930 weights for 1924–35 and to those with 1935 weights for 1935–48, in order to form our index for 1907–1948.

Our choice of weights in a sense represents the most 'favourable'

[1] If we take the 1930 weighted indices for the individual sectors of manufacturing (Table II), and re-weight them with the 1924 net values of Table IX column 3, we arrive at an index for total manufacturing of 132.8 for 1935, *i.e.* slightly *lower* than the index with 1930 weights (133.2) ; if we reweight the sector indices with the 1935 weights of table IX column 5, we arrive at an overall index of 133.1, *i.e.* almost identical with the index with 1930 weights. This is admittedly a crude test, but when the same reweighting test is applied to the 1907–1924 and 1935–1948 estimates, there is a substantial divergence between the reweighted indices and the original ones. Professor Devons states that in the period 1930–1935 a production index (for the wider field including mining and public utilities) with 1935 weights shows an increase 2 per cent smaller than the index with 1930 weights. *Cf. op. cit.*, p. 58. He does not comment on the effect of different weights for the period 1924–1930.

view of production movements which is available to us, whereas an index with 1924, 1930 and 1948 weights, would represent the most ' unfavourable ' view. Our production index is 245.8 for 1948 (1907 = 100), compared with 215.0 for the unfavourable index. What is most important, however, is not so much the absolute change in production shown by the alternative indices, but the effect of the weighting choice on the relative production movements in the different periods. The index which we have chosen shows a compound rate of production growth of 1.7 per cent per annum for 1907–1924, 2.7 per cent for 1924–1935, and 2.7 per cent for 1935–1948. The ' unfavourable ' index would show growth rates of 1.2 per cent, 2.7 per cent, and 2.2 per cent respectively. The ' favourable ' version, in fact, shows a smaller discrepancy in the rates of production growth between the different periods, than does the ' unfavourable ' version.

TABLE V

Changes in Manufacturing Output, 1907–1948

Sector	*1907*	*1924*	*1930*	*1935*	*1948*
Iron and Steel	100.0	118.8	118.3	147.9	225.0
Engineering, Shipbuilding and Vehicles ...	100.0	188.4	209.1	271.5	512.0
Non-Ferrous Metals	100.0	102.2	113.1	135.2	266.9
Chemicals	100.0	172.7	184.4	222.6	406.4
Textiles	100.0	100.1	81.6	109.1	109.2
Clothing			106.4	125.3	94.1
Leather	100.0	119.4	112.1	131.8	121.3
Food, Drink and Tobacco	100.0	102.6	115.8	129.6	174.0
Timber	100.0	108.5	145.1	176.0	152.6
Paper, Printing and Publishing	100.0	169.4	196.5	162.6	284.6
Clay and Building Materials	100.0	121.1	154.2	213.3	295.9
Miscellaneous	100.0	239.9	322.4	362.0	652.7
Total	100.0	132.6	141.9	176.6	245.8

Apart from the fact that the only available index for 1924–1935 is probably slightly more favourable than the hypothetical alternatives, there are no particularly strong reasons for our choice of the favourable rather than the unfavourable version. However, we feel that either of them is preferable to the geometric mean. It is better to have an index which expresses the viewpoint and valuations of specific historical periods, than to ignore the problem of giving the index an identifiable meaning or reference frame by a pseudo-mathematical solution.

We have tried to adjust our production estimates so that they will be identical in scope and classification for all of the years covered. The industrial classification which we adopted is that used in the 1930 and 1935 censuses, except that we have allocated the activities of government industrial establishments to the appropriate branch of manufacturing, instead of segregating them as a separate group. There were a few minor cases in which it was not possible to maintain the identity in scope and classification because of changes in the organisation of the census. Tables IX and X in the Appendix show the value of net output and employment in the firms covered by our production indices. These tables have two columns for 1924, and two columns for 1935, so that it is possible to see the degree to which our indices correspond in scope and classification for these overlap years. The notes are common to both tables, and it should be emphasised that there is no divergence at all in respect of scope and classification between the output and employment data, so that they are ideally matched for the purpose of making estimates of output per man.

VI

Having obtained our production estimates, it is easy to construct reliable estimates of output per man, because the census contains information on employment for the identical establishments for which details are given on output. The employment figures which we used in our productivity estimates are shown in Table X in the Appendix, and they include operative, administrative, clerical, and supervisory personnel and working proprietors, but exclude outworkers. It can be seen from Table VI that output per employee year rose by more than two-thirds in manufacturing as a whole between 1907 and 1948. There were, however, considerable variations between different industries ; in the clothing, leather, timber, and food, drink, and tobacco trades, output per man increased by only a fifth or less over the four decades ; whilst in engineering, shipbuilding, and vehicles it has nearly doubled, and in the clay and building materials and miscellaneous groups, the rise has been even greater.

Table VI

Changes in Output per Employee Year in Manufacturing

Sector	*1907*	*1924*	*1930*	*1935*	*1948*
Iron and Steel	100.0	118.6	120.0	139.6	150.5
Engineering, Shipbuilding and Vehicles ...	100.0	138.3	141.0	177.6	192.3
Non-Ferrous Metals	100.0	95.0	108.9	121.0	160.9
Chemicals	100.0	133.5	142.3	157.7	175.8
Textiles	100.0	103.3	99.8	134.6	159.5
Clothing			108.9	125.3	106.2
Leather	100.0	113.2	109.9	120.9	113.6
Food, Drink and Tobacco	100.0	89.9	93.5	96.8	120.8
Timber	100.0	113.0	120.0	132.0	114.8
Paper, Printing and Publishing	100.0	147.5	154.2	192.7	185.5
Clay and Building Materials	100.0	110.6	128.5	160.3	212.6
Miscellaneous	100.0	151.9	192.4	207.8	236.5
Total	100.0	120.6	127.6	151.9	169.8

The output per man estimates reflect productivity movements rather inadequately, however, because working hours fell by more than employment rose between 1907 and 1924, and from 1924 to 1935 working hours rose by only slightly less than employment. Unfortunately, the census does not contain information on working hours, so that we have to rely on the results of the Ministry of Labour's hours and earnings enquiries in order to derive our output per man hour estimates of Table VIII. The inquiries we have used were taken in the years 1906, 1924, 1935, and 1948. These data are based on the voluntary replies of employers to a questionnaire. Each of these enquiries covered a large proportion of manufacturing employment—in 1906, about 40 per cent ; in 1924, about 45 per cent ; in 1935, 71 per cent ; and in 1948 about 65 per cent. Although the samples were not the same size in each enquiry, they were all fairly evenly spread amongst the different manufacturing industries.

TABLE VII

Average Weekly Working Hours in Manufacturing

Sector	*1906*[1]	*1924*[2]	*1935*[3]	*1948*[4]
Iron and Steel, Engineering, Shipbuilding, and Vehicles	53.2	46.1	48.2	45.6
Non-Ferrous Metals	52.8	47.2	48.9	44.8
Chemicals	53.3	46.4	48.3	45.4
Textiles	55.3 } =54.3	45.3 } =44.7	47.7	44.4
Clothing	52.4 }	43.5 }	45.4	41.4
Leather	55.1	46.5	48.8	44.3
Food, Drink and Tobacco	54.1	46.4	48.5	46.0
Timber	53.8	45.9	48.3	44.7
Paper, Printing and Publishing ...	52.5	47.1	48.6	44.1
Clay and Building Materials ...	54.1	46.2	48.2	46.6
Miscellaneous	53.0	47.0	48.2	45.1
Total	53.8	45.8	47.9	45.0

[1] Source : *Hours and Earnings Inquiry, 1906*, Board of Trade 1909–1913. The data are for one week in September and represent full hours excluding meal times and overtime.

[2] Source : *Ministry of Labour Gazette*, 1926 and 1927, reports on the Hours and Earnings Enquiry. The figures are for the week ended October 18th, 1924.

[3] Source : *Ministry of Labour Gazette*, 1937, reports on the Hours and Earnings Enquiry. The figures refer to October 1935.

[4] Source : *Ministry of Labour Gazette*, 1949. The figures refer to October, 1948.

We have calculated average hours for total manufacturing by weighting the enquiry figures on working hours for each manufacturing group by the number employed as returned by the census, and in no case did this yield a figure which differed by more than a tenth of an hour from the figures derived by using the enquiry sample of employment for weighting purposes. Within our manufacturing groups, the classification of trades did not coincide in all the hours' enquiries with that of the census, so that we have used the enquiry sample of employment for weighting purposes within manufacturing groups. In several cases in which the classification of the census and the enquiries is the same, we tested our procedure by re-calculating the average working hours for particular manufacturing groups with the census employment weights. The difference in the weighting procedures did not yield differences greater than those we found for manufacturing as a whole.

The figures on hours refer to only one week of the year which, fortunately, lies within the peak autumn period in each case.[1] We were able to make a supplementary test comparison of working hours for an April week of 1924 and 1948[2] which did not show significantly different movements between

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[1] September, 1906, October, 1924, 1935 and 1948.

[2] For 1924, data are available for one week in January, April, July and October, and for 1948 for one week in April and October.

TABLE VIII

Changes in Output per Employee Hour in Manufacturing[1]

Sector	*1907*	*1924*	*1935*	*1948*
Iron and Steel	100	137	154	175
Engineering, Shipbuilding and Vehicles	100	160	196	224
Non-Ferrous Metals	100	106	131	190
Chemicals	100	153	174	206
Textiles	100	126	155	198
Clothing			146	136
Leather	100	134	136	141
Food, Drink and Tobacco	100	105	108	142
Timber	100	132	147	138
Paper, Printing and Publishing	100	164	208	221
Clay and Building Materials	100	129	180	247
Miscellaneous	100	171	228	278
Total	100	142	171	203

[1] These estimates are more approximate than those for output per man because we have had to rely on non-census data on working hours, and because they are not adjusted for changes in holidays. The figures are therefore given without decimals.

the two years from those shown by the October figures. We have assumed that the data on working hours for 1906 were also representative of the position in 1907 when there was no enquiry. It is not, of course, possible to judge whether there was a significant change in actual working hours between 1906 and 1907, but there was certainly no significant change in labour agreements on the length of the normal working week between these two years.[1] The figures on hours refer to manual workers generally, and not to salaried or clerical workers. Therefore, we implicitly assume that the working hours of salaried workers and manual workers have moved *pari passu.*

In spite of their imperfections, the data on working hours probably reflect fairly accurately the changes which have taken place in the major manufacturing groups and it seems unlikely that the movements shown are in error by more than an hour. We have not made any adjustment to our figures for changes in holidays, on which little information is available. In the 1906 enquiry on hours and earnings, information was collected on holidays and for manufacturing as a whole the average number of holidays a year including public holidays was 11.2 days.[2] The subsequent enquiries did not cover holidays, but the Ministry of Labour Gazette contains information on holidays with pay agreements for several post-war years. Assuming that, in 1948, holidays with pay formed a large proportion of total holidays, one can hazard the guess that on the average 15 days holiday were taken in that year.[1]

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[1] According to the *Board of Trade Labour Gazette*, January, 1908, p. 4, ' The changes in weekly hours of labour reported during 1907 (*i.e.* from 1906 to 1907) affected only 34,000 workpeople, and resulted in a net reduction in their working time of 71,000 hours per week.'

[2] This is the weighted average for manufacturing. There was a large variation between sectors in the length of holidays in 1906 (as there seems to have been in 1948). In the chemicals, paper, printing, and publishing, and food, drink, and tobacco groups, the 1906 average was about 8.5 days ; clay and building materials and leather about 9 days ; textiles about 10 days ; timber 10.5 ; miscellaneous about 11 ; non-ferrous metals 11.5 ; engineering, iron and steel 12.9 ; and clothing 13.8

VII

In a study of long term growth which is concentrated entirely on benchmark years, it is natural to ask whether the long term picture may not be disturbed by the fortuitous choice of years dictated by the availability of census material. In general, it would seem that we have been fairly lucky in this respect, and that the years chosen reflect long term movements reasonably well. As far as manufacturing as a whole is concerned it seems probable that 1907, 1935 and 1948 were all years in which output was at a higher level than in any previous year. In 1924, output was probably a few points lower than in the abnormal inflationary year, 1920, but higher than in any other previous year. If we exclude 1930, which was a year of recession, our other four years, even though they do not represent exactly the same cyclical phase, are reasonably comparable and, in particular, our terminal years 1907 and 1948 were both periods when capacity was probably being fairly fully used. For the separate groups within manufacturing the years chosen are also reasonably good ones for showing long term trends in output, with the exception of 1930. However, this is not true in all cases, particularly with regard to 1948 when controls had reduced output in the timber and clothing groups to abnormal levels, and had greatly retarded the growth of output in the paper, printing, and publishing group. In the case of clothing, it is doubtful whether our production figures show trends properly even for the years before 1948 because temporary influences on demand in the years chosen probably have distorted the long term movement. The fall in the output of the leather group between 1935 and 1948 correctly reflects the trend towards substitution of rubber and plastics for leather goods.

Our estimates of output per man show long term trends even better than do our production estimates, because output per man is not subject to cyclical influences to the same extent as production, although the abnormal post-war restrictions which still affected the clothing and timber trades in 1948 almost certainly distorted the long term growth of output per man in these trades. However, the output per man figures are subject to fairly erratic changes because of movements in working hours, which have been much larger in some periods than in others, and which have varied in direction. Therefore our estimates of output per man hour, although they are statistically weaker than the output per man figures, are more useful in showing long term productivity trends.

The accompanying diagram is derived from Tables V and VIII and shows the movements of production and output per employee hour for the whole of the period under review. The scale used in the diagram is semi-logarithmic so that the *proportionate* changes between successive censuses may be more easily compared.

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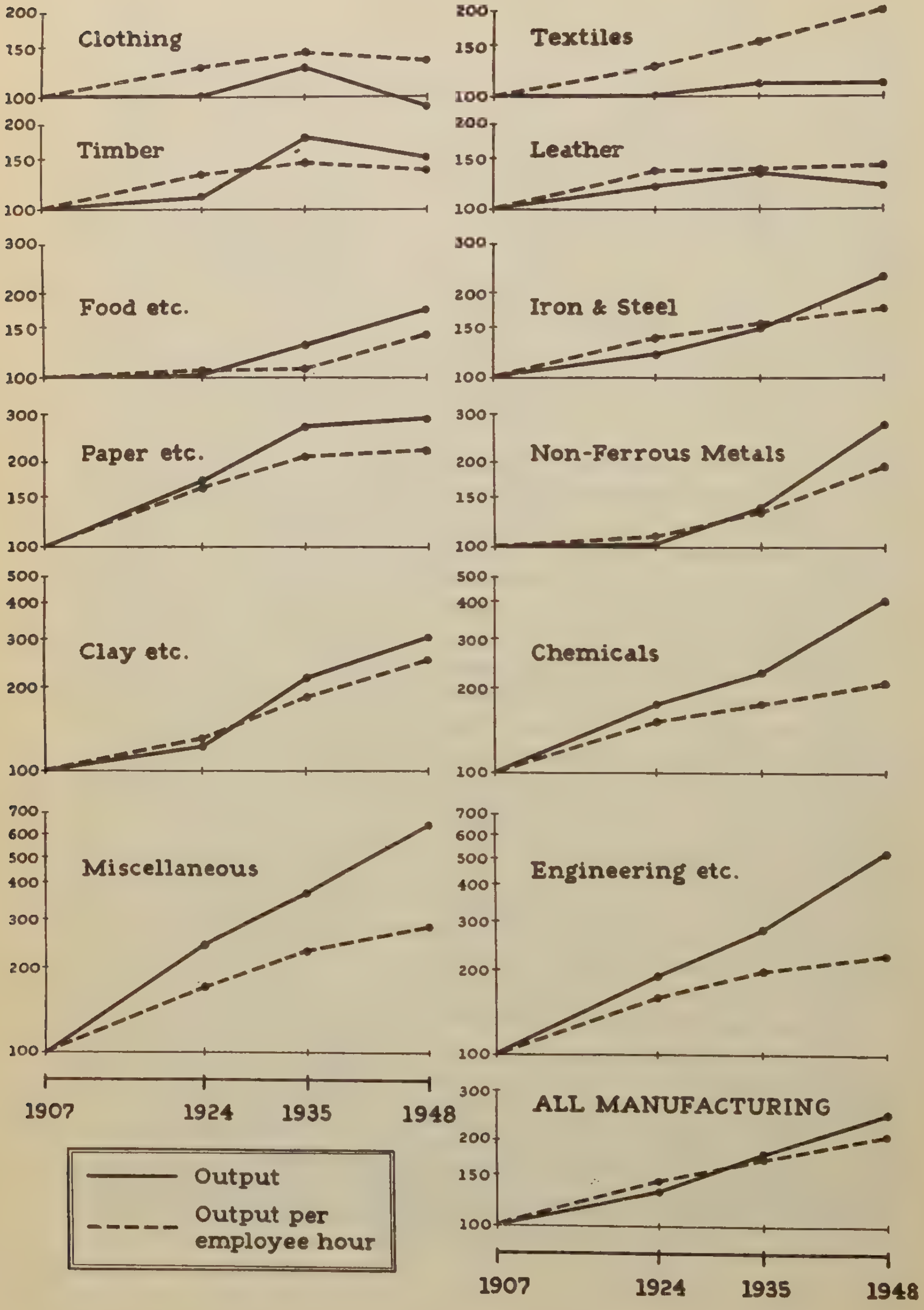
[1] *The Ministry of Labour Gazette*, April 1951, p. 135, reported that in the great majority of holidays with pay agreements, payment was made for either 12 days or 18 days, and that ' the shorter period is much more frequent and obtains in most manufacturing industries '. It also reported that there had been an extension of the number of days for which payment was made, in many industries, since the previous enquiry of August 1947.

MOVEMENTS IN OUTPUT & PRODUCTIVITY 1907-48



By 1948, total manufacturing output had risen to two and a half times its 1907 level, and output per man hour had doubled. The largest increases in production took place in the miscellaneous group,[1] where 1948 production was six and a half times that of 1907, and in the engineering and chemicals groups which quintupled and quadrupled their output respectively. The paper, printing, and publishing group, and clay and building materials group, raised their output about three-fold. However, the textiles and clothing groups were at about the same level in 1948 as in 1907, and the leather, timber, and food, drink, and tobacco groups were all relative laggards.

The productivity movements have naturally not been as widely dispersed as the production movements, but there has nevertheless been a large divergence between the experience of different groups. The biggest increases have been in the miscellaneous group, in clay and building materials, engineering, shipbuilding, and vehicles, paper, printing, and publishing, and chemicals. The laggards have been clothing, timber, leather, and food, drink, and tobacco. The movements in the latter sector are extremely interesting, because there appears to have been little progress in the three decades between 1907 and 1935, and then a sudden upsurge afterwards in which its rate of productivity growth was one of the fastest. The greater standardisation induced by wartime controls probably contributed to the high productivity increases between 1935 and 1948 in the bread and flour confectionery, biscuit, margarine, and tobacco trades.

The growth of productivity seems to be fairly highly correlated with that of output, partly no doubt because there has been a tendency to increase investment per man to the greatest extent in the most rapidly expanding industries. The biggest divergence over the whole period between production and productivity has been in textiles where productivity has increased steadily, and more than in any of the other groups where production has lagged. Between 1935 and 1948, production increased in most industries at a much faster rate than productivity, because of the rapid increase in employment and the fact that investment had been restricted in wartime.

As far as can be judged from the official index of industrial production (which has 1948 weights), and the employment and working hours estimates of the Ministry of Labour, production has increased at a faster rate between 1948 and 1954 than in any of our earlier periods, and the rate of productivity growth has also been higher.

Between 1907 and 1948 the number of people employed in manufacturing rose by 47 per cent, and there is little doubt that the proportion of the labour force employed in manufacturing has increased over this period. However, over half of the increase in employment took place between 1935 and 1948. The biggest change in working hours took place between 1907 and 1924, when there was a fall of 15 per cent from 53.8 hours per week to 45.8. There have, however, been fluctuations since then which have been not inconsiderable. The biggest long run falls in working hours have taken place in the textiles, clothing, and leather industries.

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[1] This group includes the following trades: rubber; scientific, surgical and photographic instruments; coke ovens and by-products; linoleum and oilcloth; brushes and brooms; toys and games; sports requisites; cinematograph film printing; plastic, ivory, bone and fancy goods; incandescent mantles; musical instruments; abrasives; and manufactured fuel.

Finally, it should be noted that there has been a remarkable change in industrial structure in the period under review. The metals, engineering, and chemicals groups were responsible for just over half (51.2 per cent) of manufacturing employment in 1948, whereas in 1907 they were responsible for only a third (33.6 per cent). Textiles, clothing, leather, food, drink, and tobacco employed just under a half in 1907 (49.7 per cent), compared with less than a third (30.5 per cent) in 1948.

Paris

APPENDIX

Table IX

Value of Net Output in Firms Covered by Our Production Indices

£ million

Sector	*Net output in firms covered by our production indices for 1907–1924*[1]		*Net output in firms covered by our production indices for 1924–1935*[2]			*Net output in firms covered by our production indices for 1935–1948*[3]	
	1907	*1924*	*1924*	*1930*	*1935*	*1935*	*1948*
	1	*2*	*3*	*4*	*5*	*6*	*7*
Iron and Steel	51.9	99.4[4]	106.0	98.1	122.8	129.5	456.0
Engineering, Shipbuilding and Vehicles	88.2	230.9[4]	232.1	267.6	290.5	290.0	1171.7
Non-Ferrous Metals	11.9	26.4	27.2	25.5	31.7	32.2	122.3
Chemicals	24.4	67.6	68.6	76.5	92.6	90.2	255.9
Textiles	94.7	219.4	224.0[8]	149.3	159.1	153.0	436.1
Clothing	40.5	89.3	93.4	94.2	93.1	95.9	232.5
Leather	5.1	12.8[5]	12.7	11.3	11.6	11.8	42.1
Food, Drink and Tobacco	72.2	188.4	193.3	211.9	224.8	237.1	512.5
Timber	15.2	33.0	35.6	42.2	47.8	49.1	128.8
Paper, Printing and Publishing	33.5	100.1	100.6	110.8	119.1	119.2	278.7
Clay and Building Materials	17.1	47.9[6]	45.3	47.5	57.1	59.6	152.4
Miscellaneous	10.6	35.4[7]	43.8	45.5	46.2	44.3	164.6
Total	465.3	1150.6	1182.6	1180.4	1296.4	1311.9	3953.6

Footnotes to Tables IX and X on pp. 285–286.

TABLE X

Employment in Firms Covered by Our Production Indices

Thousands of persons employed

Sector	*Employment in firms covered by our production indices for 1907–1924*[1]		*Employment in firms covered by our production indices for 1924–1935*[2]			*Employment in firms covered by our production indices for 1935–1948*[3]	
	1907	*1924*	*1924*	*1930*	*1935*	*1935*	*1948*
	1	*2*	*3*	*4*	*5*	*6*	*7*
Iron and Steel	509.1	509.8[4]	539.6	531.4	571.1	577.4	814.2
Engineering, Shipbuilding and and Vehicles	842.0	1147.0[4]	1157.6	1260.0	1298.9	1280.3	2230.9
Non-Ferrous Metals	114.5	123.2	129.4	124.9	134.4	135.1	200.5
Chemicals	142.9	184.8	188.3	188.7	205.6	204.0	334.0
Textiles	1253.2	1258.0	1278.0[8]	1079.1	1069.4	995.9	840.9
Clothing	624.8	561.3	623.8	629.3	644.1	613.5	543.3
Leather	53.2	56.1[5]	55.6	53.8	57.5	57.3	56.1
Food, Drink and Tobacco ...	452.1	516.2	539.9	585.9	633.4	644.8	693.2
Timber	180.3	173.1	189.8	239.1	263.6	255.5	254.7
Paper, Printing and Publishing	324.5	372.7	374.7	415.7	444.5	393.7	443.4
Clay and Building Materials	205.6	225.2[6]	219.8	240.9	267.0	271.7	284.2
Miscellaneous	92.6	146.3[7]	178.0	188.8	196.3	187.0	296.2
Total	4794.7	5273.7	5474.5	5537.6	5785.8	5616.3	6991.5

Notes to Tables IX and X.

[1] The data in columns 1 and 2 cover all firms in the U.K. (including Southern Ireland in 1907) whose output and employment was recorded by the census. They are derived from the first and third censuses of production. These censuses theoretically extended to all firms but their coverage was incomplete ; *cf.* part II *supra* for a discussion of this. Apart from the minor differences in scope and classification mentioned in notes 4 to 8 below, the *lacunae* due to non-reporting small firms account for the differences between column 2 and column 3.

[2] The data in columns 3, 4 and 5 cover all firms in the U.K. They are derived from the data in the Final Summary Tables of the 1935 Final Census report on large and small firms, and from the estimates in this report on non-reporting firms. For 1930, we used the corrected estimates of employment in small and non-reporting firms recorded in the *Annual Abstract of Statistics*, No. 84, 1935–46, p. 124. The net output of small firms has been calculated as described in part III *supra.*

[3] The data in columns 6 and 7 cover all firms in Great Britain and exclude Northern Ireland. The net output figures are taken from B. C. Brown, *op. cit.* Column 7 on employment is derived from the figures in the 1948 census reports for employment in all firms (including the census estimates for non-reporting firms) and column 6 is derived from these figures by applying Brown's employment ratios. As Column 6 excludes Northern Ireland it should always contain smaller figures than column 5. However, this is not the case for certain groups because there were some minor revisions of the 1935 data which appear in the 1948 census, and there was also some reclassification of the 1935 data between trades which were sometimes in separate groups. For example, the higher figure for clay and building materials in column 6 is largely due to the fact that ' asbestos cement goods ' were included in the building materials trade in 1948, and ' other asbestos goods ' formed a separate trade in the textiles group ; whereas in the 1935 census, all asbestos goods were included in the trade called ' asbestos goods, engine and boiler packing ' which was in the textile group. The figures on net output in columns 5 and 6 show a bigger discrepancy than those for employment. This is due to the difference between Mr. Brown's assumptions on the value of net output per head in small firms and those which we made for the period 1924–1935.

[4] The data in columns 1 and 2 for the engineering group include some foundries which in columns 3 to 7 are included with iron and steel. Similarly, the data in columns 1 and 2 for

iron and steel include a small amount of constructional engineering work which in columns 3 to 7 is included with the engineering group.

[5] The data in columns 1 and 2 on the leather group include the 'saddlery hardware, harness furniture and cart gear' trades, whereas these trades were classified with other groups in columns 3 to 7. However, these trades employed only a few hundred persons, even in 1907.

[6] The data in columns 1 and 2 on the clay and building materials group include the engine and boiler packing and roofing felts trades, whereas these trades are included with the textiles group for later years. In 1907, the net output of the engine and boiler packing trades was £0.3 million and in 1924 £2.2 million; in 1907 employment was 2.4 thousand, and in 1924 6.9 thousand. In 1924 net output of the roofing felts industry was £0.3 million, and employment 0.8 thousand—no data are available on 1907 net output and employment in this trade. The output of a few quarries (with about 2,000 employees) belonging to cement works is included in columns 1 and 2, but not in the later figures.

[7] Columns 1 and 2 exclude the following trades which are included in the miscellaneous group in columns 3 to 7: coke and by-products, manufactured fuel, manufactured abrasives, incandescent mantles, and film printing. The 1924 net output of these trades combined was £6.7 million, and they employed 25,000 persons. No comparable data are available for 1907 for most of this output and employment.

[8] *Cf.* note (6). Columns 3 to 7 include the textile packing trade, the activities of which were not recorded in 1907 and are not included in columns 1 and 2. In 1924, 8.5 thousand were employed in textile packing, and their net output was £1.8 million.

MAJOR CONSUMER EXPENDITURES AND OWNERSHIP OF DURABLE GOODS

By L. R. KLEIN

The Savings Surveys concentrate attention on detailed items of consumer finances and on the flow of funds into and out of consumer units through various channels. We deliberately avoid collecting information on details of consumer expenditures such as items of food consumption, clothing, fuel, entertainments, etc.; but in connection with estimates of some components of savings, we find it useful to collect information on particular items of expenditure, namely, outlays on consumer durables and on repairs and decorations of residential property. The information on consumer durables is intimately related in an accounting sense to one component of savings, *i.e.* changes in consumer credit, and is also linked with major changes in liquid assets and with windfall gains. The questions put to respondents on outlays for repairs and decorations are also closely connected with that item of saving consisting of structural alterations or additions to property, and the data collected on the latter item are improved by specifying details of the former.

Expenditures on consumer durables are estimated from direct questions about purchases of motor-cars, motor-cycles, television sets, refrigerators, and washing machines. A further question is asked about any other expenditure of £25 or more, including such *prompted* items as household appliances, furniture, carpets, and fur coats.[1] Reported items which are obviously not consumer durables are excluded from the final tabulations. Expenditures are valued net of the receipts from the sale or part exchange of goods, but not net of credit granted. In the case of outlays for repairs and decorations, both materials and paid labour are included.

Both expenditures on durables and on repairs and decorations are large salient items not involving memory problems such as arise over outlays on bread, milk, coal, bus fares, etc., in family budget enquiries. Any such major items of expenditure, whether intimately related to particular savings components or not, could potentially be estimated in the Savings Surveys. Limitations on length of questionnaire confine this aspect of the Surveys to narrow bounds, but in the 1953 investigation a question was included on educational expenses for children. We shall consider below some tabulations on this particular item as well as the other two—durables and repairs and decorations.

EXPENDITURES ON CONSUMER DURABLES

In the Savings Surveys, as well as in most systems of national income accounts, an arbitrary line is drawn between consumption expenditures and personal savings. The purchase of real estate and additions or alterations to real estate are all treated as acts of personal saving which are automatically offset by capital formation.[1] Purchases of motor-cars, television sets, washing machines and similar durable goods are treated as consumer expenditures which, together with expenditures on non-durables, satisfy the basic identity

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[1] The lower limit of admissible expenditures is £10 in the 1954 Savings Survey.

$$\text{saving} + \text{consumer expenditures} \equiv \text{disposable income.}$$

Actual cash receipts from property rental and also the imputed rent on owner occupied homes are included in total income in the Surveys, so that property is consistently treated as an income producing asset and capital expenditures are properly reckoned as savings. We impute no income from the ownership of consumer durables and do not treat expenditures on them as savings.

The suggestion has often been made that the arbitrary line between savings and expenditures be shifted so as to make outlays on durables, like outlays on property, part of personal saving. The argument may be put forward that purchases of durables add to one's stock of wealth since durables are generally not wholly used up in one accounting period. If we measure savings as the change in wealth between two accounting dates, it can be claimed that, in principle, all components of wealth should be included in saving. It follows that, in principle, these assets ought to be depreciated each period if they are to be included in saving.[2]

At a pragmatic level, a further argument is put forward that saving (as now estimated) *plus* gross outlay on durables bear a more stable relationship to income than does either component by itself. In Diagram 1, we plot, from the 1954 Savings Survey, the relationship of savings, durable goods expenditures, and the sum of these two items, to net income. The points plotted in these graphs are averages within income classes and give the appearance of smooth curves and suggest high correlations. If, however, we take into account the dispersion of individual values about these lines of average relationship, we find the following correlations (calculated from data in the 1953 Survey):

	correlation coefficient
net income and savings	+0.23
net income and savings *plus* durables	+0.49

The higher correlation between savings plus durables and net income is, in fact, a reflection of the negative correlation between savings and expenditures on durables, pointed out previously in other connexions.[3] It may also be expressed as a high degree of substitutability between savings and durable goods.

If savings plus durables were perfectly correlated with income; if non-durable consumption were also perfectly correlated with income; and if savings and durables individually were imperfectly correlated with income,

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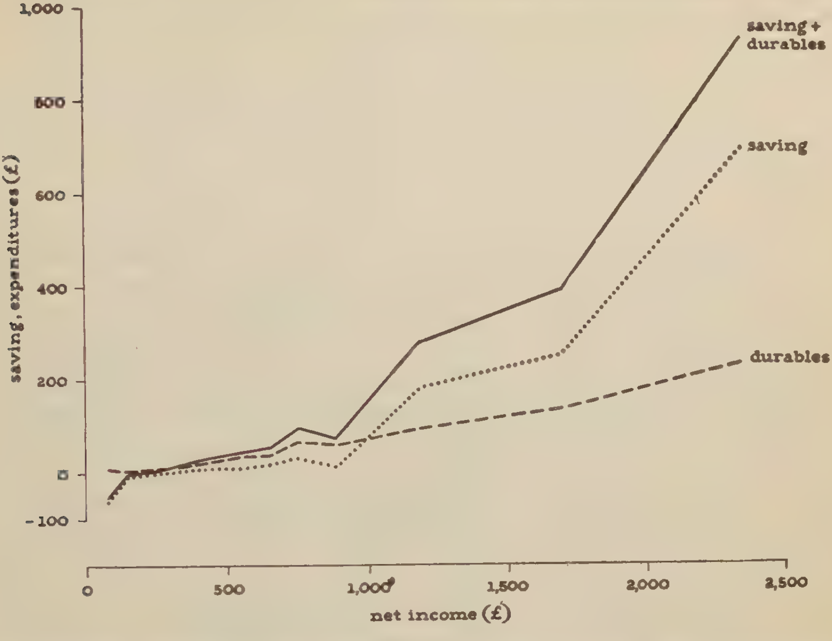
[1] Other components of personal saving are not automatically offset by capital formation. They represent the flow of funds to financial intermediaries, other persons, etc.

[2] Residential property is not depreciated in arriving at the savings estimates now computed in the Surveys, but we do use *net* annual value for an estimate of imputed rental income.

[3] H. F. Lydall, BULLETIN, Vol. 15, No. 10–11 Oct. and Nov. 1953, pp. 394–400. These articles are reprinted in H. F. Lydall, *British Incomes and Savings* (Oxford: Basil Blackwell) 1955. L. R. Klein, BULLETIN, Vol. 17, No. 2, 1955, pp. 208–11.

DIAGRAM I

The Relationship of Savings and Expenditure on Durable Goods to Net Income, 1953-54



the residual variation in one would be the negative of the residual variation in the other. The residual variation is made up of two components in this context. Firstly, there are other measureabl variables besides income which influence spending and saving. The negative correlation between savings and expenditures on durables can be partly accounted for in terms of the effects of these other variables besides income which influence behaviour. In particular, liquid asset holdings and the receipt of windfalls seem to have differential directions of effect on saving and on durable expenditures. The fact that these variables are negatively correlated with saving and positively correlated with durable expenditures helps to explain some of the negative correlation between saving and expenditures on durables. Some other measurable factors are common to the explanation of saving and spending behaviour, but many of these have the same direction of effect on both variables and cannot account for the savings-durables negative correlation except insofar as the magnitude of their effects varies greatly between the two cases.

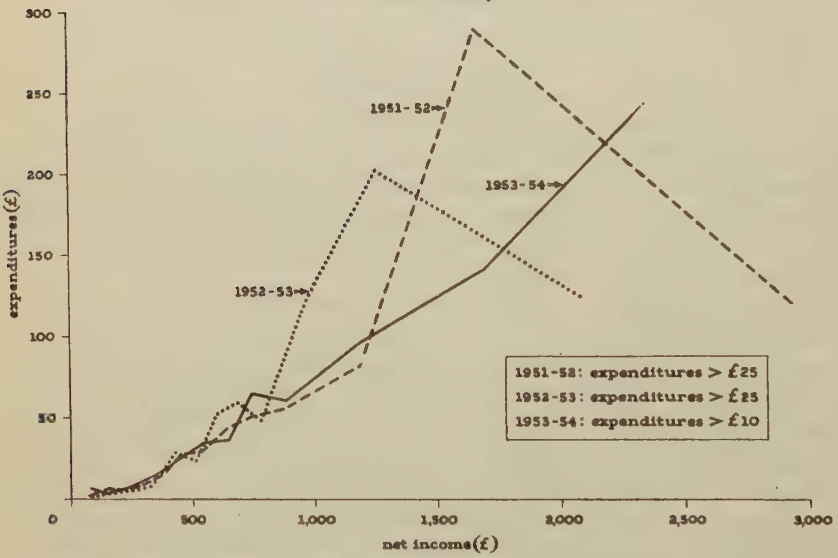
Secondly, there are in the residual variation, disturbing factors (supposedly random perturbations) which are not directly observable. The disturbances in savings behaviour may be negatively correlated with the disturbances in spending behaviour. This could lead to negative correlation between saving and expenditures on durables even though they were both similarly related to major common factors.

A search for high correlations, as such, would probably lead one to pool savings and durable expenditures together as a single variable. As we have suggested here, and will attempt to justify empirically below, a more thorough understanding of behaviour is given by separating savings and durable expenditures. Indeed, policy decisions, which must take into account the opposing types of influence of particular variables on each of these two magnitudes separately, will be best served if we analyse savings behaviour apart from spending (on durables) behaviour.

Income

As in the case of contractual saving, expenditures on durable goods are always positive.[1] At low income levels, expenditures on durables are frequently nil or small positive amounts. Expenditures rise somewhat faster than at a linear rate in the low income groups but thereafter the relationship becomes essentially linear. The expenditure-income pattern is more nearly linear throughout the entire income range in 1953–54, when respondents reported expenditure in excess of £10 instead of £25 as in the earlier Survey. These patterns are drawn in Diagram II.

DIAGRAM II
The Relationship of Expenditure on Durable Goods to Net Income in Three Surveys



From Table I we see that the percentage of purchasers rises steadily with income level, with the particular exception of the top income class in the 1953 Survey. There is naturally more dispersion of amounts spent in the upper than in the lower income classes.

The distribution of expenditures and the mean expenditure seem to hav

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[1] We neglect the rare case in which trade in values exceed gross purchases. In fact, the Savings Surveys assign zero values in such instances. Durable goods are not depreciated in our statistics.

Table I

Expenditures on Durable Goods by Income
Savings Surveys, 1953 and 1954
(percentages of income units)

Expenditures on items costing £25 or more, 1952–53 (£)	*Gross income, 1952–53 (£)* 0–99	100–199	200–299	300–399	400–499	500–599	600–699	700–799	800–999	1000–1499	1500–1999	2000 & over	*All income classes*
Nil	97.0	95.7	91.2	84.8	68.2	69.2	52.6	51.4	50.4	48.9	25.6	48.5	77.4
1—49	2.8	2.5	4.4	7.7	10.2	15.1	19.3	12.0	22.2	4.6	7.7	3.0	8.9
50—99...	0.3	0.9	3.0	5.0	13.0	8.1	13.0	19.3	8.9	16.1	32.1	3.0	7.0
100—199	—	0.9	1.2	2.1	6.3	5.7	8.0	9.6	15.7	13.1	12.8	30.6	4.5
200 and over	—	—	0.2	—	2.3	1.9	7.2	7.8	2.8	17.4	21.8	14.9	2.1
	100	100	100	100	100	100	100	100	100	100	100	100	100
Mean all units (£) ...	*1*	*3*	*6*	*9*	*28*	*24*	*52*	*58*	*48*	*123*	*202*	*123*	*23*
Mean with expenditure (£)	*36*	*62*	*65*	*57*	*89*	*76*	*110*	*120*	*97*	*240*	*272*	*238*	*100*

Expenditures on items costing £10 or more, 1953–54 (£)... ...	*Net income, 1953–54 (£)* 0–99	100–199	200–299	300–399	400–499	500–599	600–699	700–799	800–999	1000–1499	1500–1999	2000 & over	*All income classes*
Nil	85.3	89.0	80.4	65.3	51.5	45.8	39.8	36.0	34.9	39.8	30.6	26.7	61.7
1—49	10.8	8.7	16.9	22.5	32.5	29.6	30.8	24.5	24.7	22.4	24.5	15.6	22.2
50—99...	2.0	2.2	1.8	10.8	9.9	15.7	18.0	22.1	18.9	14.5	10.2	2.2	9.8
100—199	2.0	—	0.2	0.8	4.6	7.8	10.6	8.3	14.8	10.0	12.2	6.7	4.3
200 and over	—	—	0.7	0.6	0.8	1.0	0.8	9.1	4.6	13.3	22.4	48.8	1.7
N.A.	—	0.1	—	—	0.7	—	—	—	2.2	—	—	—	0.2
	100	100	100	100	100	100	100	100	100	100	100	100	100
Mean all units (£) ...	*7*	*3*	*7*	*15*	*24*	*34*	*37*	*65*	*61*	*97*	*141*	*241*	*25*
Mean with expenditure (£)	*46*	*29*	*36*	*44*	*50*	*63*	*62*	*102*	*95*	*161*	*203*	*329*	*66*

TABLE II

Expenditures on Durable Goods by Liquid Assets
Savings Survey, 1954
(percentages of income units)

Expenditures on items costing £10 or more 1953–54 (£)	*Liquid assets held one year ago (£)*											
	Nil	*1–49*	*50–99*	*100–199*	*200–399*	*400–599*	*600–799*	*800–999*	*1000–1499*	*1500–1999*	*2000 & over*	*N.A.*
Nil	71.2	62.4	49.9	53.4	56.2	56.8	63.2	56.2	57.7	56.8	59.8	36.3
1—49	19.6	23.0	25.1	27.3	28.0	13.4	12.5	19.3	16.7	27.0	19.1	37.6
50—99	6.7	9.2	13.8	15.1	9.8	15.8	5.2	6.2	17.5	2.7	9.1	19.0
100—199... ...	2.3	4.4	9.5	2.7	4.9	8.4	7.6	5.7	3.8	9.9	2.9	4.9
200 and over ...	0.3	0.6	1.8	0.5	1.1	5.8	11.6	12.5	4.3	3.6	9.1	1.8
N.A.	—	0.4	—	0.9	—	—	—	—	—	—	—	0.4
	100	100	100	100	100	100	100	100	100	100	100	100
Mean all units (£)	*12*	*20*	*31*	*24*	*25*	*44*	*76*	*93*	*44*	*42*	*60*	*42*
Mean with expenditures (£) ...	*43*	*52*	*62*	*51*	*58*	*101*	*205*	*213*	*103*	*97*	*150*	*66*

shifted upwards between the 1952 and 1953 Surveys. This was pointed out in a previous article.[1] We cannot conclude from Table I that a similar shift occurred between the 1953 and 1954 Surveys because of the shift in the lower limit of admissible expenditures from £25 to £10. An *approximate* calculation obtained by excluding all income units with total expenditures between £10 and £24 in 1954 suggests a stable average outlay between the two years.[2] Aggregate national income statistics of consumer expenditures on durable household goods and motor vehicles show an increase of about 14 per cent between the calendar years 1952–1953 and between 1953–1954. During this period there has been a steady growth of television licenses and of new registrations of motor-cars and motor-cycles. The Surveys have probably underestimated some of the recent time growth of expenditures on durables.[3]

Liquid assets

Among the major factors likely to have a different impact on saving and on expenditures for durables, we single out liquid assets for particular mention. Assets held in liquid form are available for the purchase of durables or, at least, for a down payment on them. Saving, on the other hand, is known to be negatively correlated with liquid assets. Especially, the possession of liquid assets of sizeable amounts permits spending in excess of income—dissaving.[4] The negative saving-asset correlation prevails even when the effects of income, age, size of income unit, income change and other variables are simultaneously taken into account.

Expenditures on durables, when cross-tabulated against beginning-of-year liquid assets in the 1954 Survey, show some positive correlation. There is much more large spending (£200 or more per year) for asset holdings in excess of £400—a year's income or more, on the average—but there is not much growth in the percentage of units actually purchasing something as we move up the asset scale.

The simple correlation between purchases of durables and holdings of liquid assets is only moderately strong; moreover, liquid assets are themselves correlated with other variables which perhaps are more strongly associated with expenditures—income and age being two important cases. We are, therefore, interested in the *net* or *marginal* effect of liquid assets on expenditures. As a by-product of some multiple regression calculations made by M. R. Fisher with the 1953 sample, we can derive an estimate of the marginal effect of liquid assets on expenditures.[5] He has estimated the following two equations :

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[1] T. P. Hill, L. R. Klein, and K. H. Straw, BULLETIN, Vol. 17, No. 1, 1955, pp. 89–126.

[2] T. P. Hill, BULLETIN, Vol. 17, No. 2, May 1955, p. 145.

[3] For a comparison of changes in ownership frequencies of motor-cars and television sets between two Surveys with changes in outstanding licences, see p. 309 below.

[4] L. R. Klein, BULLETIN, Vol. 17, No. 2, May, 1955, pp. 181–83. While the simple correlation between savings and liquid assets is, on balance, negative there is substantial dispersion in their relationship at high asset levels.

[5] The special sample used for these calculations consists of the 97 per cent of the 1953 sample for which the values of all the variables studied were ascertained.

$$S + E = -37.42 \quad \underset{(1.7)}{-13.1\,N} \quad \underset{(0.01)}{+0.25\,Y} \quad \underset{(0.005)}{-0.025\,L} \qquad R = 0.52$$

$$S = -29.54 \quad \underset{(2.0)}{-5.9\,N} \quad \underset{(0.01)}{+0.14\,Y} \quad \underset{(0.006)}{-0.040\,L} \qquad R = 0.29$$

where S = saving
E = expenditure on durables
N = number of persons in the income unit
Y = net income
L = liquid assets one year ago
R = multiple correlation coefficient

In parentheses below the coefficients are given the estimated standard errors. By subtracting the second equation from the first, we find

$$E = -7.88 \quad -7.2\,N \quad +0.11\,Y \quad +0.015\,L$$

This result shows a positive marginal effect for liquid assets but leads to unacceptable implications about the effect of income unit size.[1] It lacks an age variable, and this is of particular importance because of the significance of age for understanding both expenditures and liquid asset patterns.

Fisher has made additional calculations of these two types of equations for each of six age groups and finds in every case except one that the marginal effect of liquid assets on durable expenditures, derived as above, is positive. The two above equations are also interesting in showing the increase in correlation if one includes durable goods purchases in the savings concept.

Analogous calculations of regression equations from crudely grouped data in the 1953 and 1954 samples bring out the multivariate relationship of expenditures on durables to income, liquid assets, and age. From the 1953 sample we have for each *gross* income class, estimates of mean expenditures, mean *net* income, mean liquid assets held one year ago, and mean age of the income unit head. These same variables are averaged by *net* income classes for the 1954 sample. On pooling the two samples together, we estimate the least-squares regression:

$$E/Y = \underset{(0.03)}{0.23} + \underset{(0.005)}{0.059\,L/Y} \underset{(0.0018)}{-0.0046\,A}$$

A = age of income unit head

As in the more detailed calculation by Fisher, this equation shows a positive asset effect on expenditures, but the marginal coefficient is much higher, partly because we have also included the age variable in the regression. At the average age (47 years), the marginal income effect is lower than in Fisher's sample; however, the marginal propensity to spend, according to this equation, varies widely from low to high age levels. There are only 24 pooled income classes from the two surveys underlying these roughly estimated equations.[2]

From the 1953 sample alone we have made an extended calculation introducing an additional variable representing home ownership. (H = fraction of income units owning home in each income class.) This equation, based only on 12 grouped observations is:

$$E/Y = \underset{(0.09)}{0.24} + \underset{(0.038)}{0.065\,L/Y} \underset{(0.0021)}{-0.0053\,A} + \underset{(0.045)}{0.087\,H}$$

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[1] See pp. 399, 401 below.

[2] The crudeness of the above calculation is emphasised by the fact that durable goods expenditures in the 1953 sample include only items in excess of £25 while those in the 1954 sample include items in excess of £10.

With more degrees of freedom than we have used for the rough calculation, we might expect an equation of this type to give a tolerably good description of individual expenditure behaviour.

Windfalls

Liquid assets at the beginning of an accounting period give an indication of available purchasing power for spending during that period. Further, and probably more significant, indications are given by income receipts during the period. Besides these two factors already considered here, we must recognize the possible importance of the receipt of windfalls for the purchase of durable goods.[1] A cross tabulation of expenditure against windfalls based on the 1953 Survey has therefore been computed, (Table III).

TABLE III

Expenditure on Durable Goods by Windfall Receipts
Savings Survey, 1953
(percentages of income units)

Expenditures on items costing £25 or more 1952–53 (£)	*Amount of windfalls 1952–53 (£)*									
	Nil	*1–9*	*10–19*	*20–49*	*50–99*	*100–199*	*200–499*	*500–999*	*1000–1999*	*2000 & over*
Nil	79.2	67.4	70.7	64.6	58.2	62.8	42.5	59.1	56.8	16.7
1—49...	8.5	16.7	3.5	15.5	18.9	8.7	9.2	4.6	5.4	16.7
50—99	6.8	16.0	0.6	12.1	14.3	7.7	1.7	—	5.4	16.7
100—199	3.8	—	14.0	6.8	2.0	19.9	29.2	13.6	16.2	33.3
200 and over ...	1.7	—	11.2	1.1	6.6	1.0	17.5	22.7	16.2	16.7
	100	100	100	100	100	100	100	100	100	100
Mean all units (£) ...	*19*	*19*	*71*	*26*	*32*	*39*	*126*	*148*	*92*	*156*
Mean with expenditures (£)	*93*	*58*	*240*	*74*	*76*	*104*	*219*	*362*	*212*	*187*

There is a distinct correlation between expenditures and the receipt of windfalls, although we find irregularities in the sample relationship due, in some measure at least, to the relative infrequency of receipt of windfalls. Only 11 per cent of the respondents reported any such receipt.

Windfalls provide an instance of another variable that has a different impact on saving and durable goods expenditure. As was pointed out in a previous article,[2] windfalls are automatically recorded as a negative item in the saving accounts of the recipient, and unless offset by some increase in consumer assets (excluding durable goods) will tend to be negatively associated with saving. We do, in fact, find a negative correlation between saving and windfalls in our sample.

Hire purchase and trade-in

The possession of liquid assets or the (infrequent) receipt of windfalls are sources from which the customary income stream is supplemented for the purchase of durables. Equally important in this respect are the avenues of consumer credit and second-hand markets. In Table I we see that 22.5 per cent of income units purchased durables during 1952–53. Of these, 43 per cent actually used hire purchase credit. The remainder presumably paid cash in full. In this restricted group of users of hire purchase, we estimate a mean net income of £517, mean liquid assets of £100, and a mean age of 39 years. These characteristics indicate that, on the average, the users of hire purchase are in the general age class of frequent purchasers of durables,[1] at about the average income of units in this age range, but at lower levels of liquid assets. Thus it appears that income units who have the income ability to make current payments use hire purchase to supplement a comparatively weak liquidity position.

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[1] Windfalls consist of the following *lump sum* cash receipts: legacy, gift, life insurance benefit, pension fund benefit, football pool winnings, sweepstake winnings, post-war credit, and any other payment of this nature.

[2] L. R. Klein, BULLETIN, Vol. 17, No. 2, May 1955, p. 176.

Only 10 per cent of the purchasers of durables did so through trading-in another durable. For the most part, trading-in represented the exchange of old and worn items for newer items of the same type, but occasionally a wireless set was traded in for a television set, and similar substitutions were made for other items. This seemingly infrequent method of supplementing income and liquid asset levels is possibly associated with the wealth-spending relationship which is commented on later.

Calculations on the use of hire purchase and trade-in facilities in buying durable goods have similarly been made for 1953–54. A subsample of those persons interviewed in 1953 was re-interviewed in 1954. This subsample of 429 income units is independent of the main 1954 sample, but some special tabulations have been made from it, and they are worth reporting now. In this sample 39 per cent of income units bought durables (costing £10 or more) and 45 per cent of these used hire purchase credit while 14 per cent traded in old goods.[2] Both these last two percentages are slightly larger than the figures cited above for 1953, but in view of the smallness of the sample we cannot feel confident that these represent significant upward shifts. The mean income, mean liquid assets, and mean age of the users of hire purchase credit in this sample are not very different from the corresponding means in the 1953 sample. They are £515, £176 and 42 years respectively. The asset mean may be significantly higher than the figure for 1953, but we still interpret these data as showing that hire purchase is used, on the average, by people in the age group 35–44 with higher-than-average income and lower-than-average liquid assets.

Income change

Among the main economic variables affecting individuals' outlays on durables, we naturally find it useful to consider the rate of change of income, one of the major dynamic factors in the economy. Income change is not independent of income; hence we are in much the same position as with

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[1] See Table VI below.

[2] It is interesting and reassuring to observe that the main 1954 sample, consisting of 2,463 income units, shows 38.3 per cent of income units buying durable goods costing £10 or more. See Table I.

TABLE IV

Expenditures on Durable Goods as a Percent of Net Income by Percentage Change in Gross Income
Savings Survey, 1953
(percentages of income units)

Expenditures as per cent of net income	*Percentage increase in gross income*					*No change*	*Percentage decrease in gross income*					*N.A.*
	50 and over	*25–49*	*15–24*	*5–14*	*0.1–4*		*0.1–4*	*5–14*	*15–24*	*25–49*	*50 and over*	
Nil	79.7	75.8	74.0	77.8	74.8	79.7	65.2	77.6	81.9	64.0	90.6	77.9
1—5	0.5	0.5	3.7	2.2	3.5	2.5	11.6	0.6	0.4	1.0	—	0.2
6—10	1.4	7.0	11.7	6.4	7.2	5.4	10.7	7.0	0.8	9.2	—	4.6
11—25	6.0	5.1	7.4	6.9	8.4	9.5	11.6	12.1	9.5	10.8	—	11.8
26 and over ...	12.4	11.6	3.2	6.7	6.1	3.0	0.9	2.7	7.3	15.0	9.4	5.2
N.A.	—	—	—	—	—	—	—	—	—	—	—	0.2
	100	100	100	100	100	100	100	100	100	100	100	100

liquid assets in trying to disentangle the intercorrelation with income. In Table IV, we eliminate the income effect, approximately, by recording durable goods expenditures and income change as percentages of income, in the former case using current income and in the latter using the previous years' income as divisors.

These results do not indicate a poweful income change effect, but they do show the possibility that this factor explains a small part of the variability in expenditure. Some differences can be seen at extreme points in the income-change scale. Those with the largest percentage increases spend a high fraction of their income frequently. Similarly, those with the largest percentage decreases buy least frequently. There are not many in this latter group, and the few who do spend something have comparatively high variability in their outlays. Those with income decreases between 25 and 50 per cent do, however, mark an exception. They buy more frequently than any other group in Table IV, and include some large purchasers. For moderate income changes, either positive or negative, it is difficult to discern any particular pattern of spending behaviour.

Housing status

Several demographic variables are important in discriminating between purchasers and non-purchasers of consumer durables. Tabulations by housing status are revealing in two directions. Firstly, they show how home ownership and type of rental are related to purchases. Secondly, they enable us to distinguish between primary and secondary income units.[1] The latter point is important because secondaries are infrequent purchasers and because many items are bought for group use; a group wider than an income unit and certainly as wide as a household, *i.e.* a collection of income units sharing a common table. Comparatively few tabulations have been made on a household basis;[2] therefore we infer something about household purchases from examination of primaries and secondaries separately.

TABLE V
Percentage of Purchasers of Durables and Mean Purchases by Housing Status
Savings Survey, 1953

Housing status	*Per cent purchasing items costing £25 or more*	*Mean amount, all units (£)*	*Mean amount, with expenditure (£)*
Own outright	29.3	*32*	*108*
Own, mortgage	29.2	*36*	*122*
Rent, council house	29.7	*27*	*89*
Rent, other unfurnished ...	21.4	*20*	*95*
Rent, furnished	14.4	*13*	*92*
Rent free	28.4	*35*	*125*
All primaries	25.3	*26*	*101*
All secondaries	13.6	*12*	*90*

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[1] Primary units are heads of households ; secondaries are not.

[2] See H. F. Lydall, and R. F. F. Dawson, BULLETIN, Vol. 16, No. 4, April 1954, pp. 97–129.

Since many of the durables are an integral part of the home, it is reasonable to find a high frequency of purchasers among home owners. They also spend comparatively large sums, although the most expensive durable item considered is a motor-car, and this asset is not strongly tied to home ownership. The frequent and large expenditures of home owners could be explained by their superior income position. People renting furnished accommodation do not spend very frequently, but they do seem to spend amounts nearly as large as most other groups when they do make a purchase. Secondaries exhibit much the same type of behaviour. They buy infrequently, but spend only slightly less than most others, on the average, when they do buy.

The frequency of purchases among all income units in the sample is 22.5 per cent, and primary units represent 77.3 per cent of all units. If all secondary purchasers were the sole buyers in their household and if there were only one secondary unit per household, the maximum purchasing frequency possible among households in our sample would be about 29 per cent $(.291 = \frac{.225}{.773})$. We know that neither of these two assumptions is correct; therefore the actual percentage of households with purchases is somewhere between the rate for primaries, 25.3, and 29.1.

Age

The secondary income units, which we found in the preceding paragraphs to be infrequent purchasers of durables, are mostly either quite young people or fairly old. Young single people have not yet established permanent family arrangements nor acquired homes. They also have not yet reached a stage of comparatively high earning power. These characteristics make for infrequent purchases of durables. Elderly people have accumulated throughout their lifetime many of the durables they want or use. Moreover, they are not prospective purchasers of some types of durables which they may not own, such as motor-cars and motor-cycles.

The age patterns of durable goods expenditures in Table VI are statistically descriptive of the above considerations.[1] There is a similarity between the patterns from the Surveys of 1953 and 1954, but we naturally expect these patterns to remain stable from year to year.

Size of income unit

Housing tenure, age, size of income unit and marital status are all interwoven in a pattern that we may call the 'life-cycle' or 'demographic structure'.[2] The secondary units, who have no separate housing status apart from that of the associated primary, are concentrated not only in certain age classes, but also are usually single-person income units. They are at the

[1] For a discussion of age, in relation to saving and spending, based on these same data see Harold Lydall, 'The Life Cycle in Income, Saving, and Asset Ownership', *Econometrica*, Vol. 23, April 1955, pp. 144–49.

[2] A constructed variable combining these several demographic factors into one dimension has been extensively analysed in the context of the American *Surveys of Consumer Finances* See e.g. the chapters by J. B. Lansing and J. N. Morgan in *Contributions of Survey Methods to Economics*, ed. by L. R. Klein (New York : Columbia Univ. Press) 1954.

TABLE VI
Expenditures on Durable Goods by Age of Income Unit Head
Savings Surveys, 1953 and 1954
(percentages of income units)

Expenditures on items costing £25 or more 1952–53 (£)	*Age of head* 18–24	25–34	35–44	45–54	55–64	65&over
Nil	86.9	62.6	70.4	74.9	82.1	91.9
Some expenditure	13.1	37.4	29.6	25.1	17.9	8.1
	100	100	100	100	100	100
Mean all units (£)	*9*	*39*	*30*	*27*	*15*	*9*
Mean with expenditure (£)	*67*	*104*	*102*	*107*	*83*	*108*
Expenditures on items costing £10 or more 1953–54 (£)						
Nil	78.6	46.6	47.7	54.2	65.0	82.8
1—49...	15.4	25.9	29.6	25.0	24.1	12.5
50—99	4.0	14.7	14.3	12.5	8.6	3.0
100—199	1.1	10.2	5.0	6.3	1.3	0.6
200 and over	0.9	2.0	2.9	2.0	0.8	1.1
N.A.	0.1	0.6	0.5	—	—	—
	100	100	100	100	100	100
Mean all units (£)	*10*	*39*	*36*	*33*	*17*	*10*
Mean with expenditure (£) ...	*47*	*73*	*69*	*71*	*49*	*56*

beginning or end of the typical adult life cycle. In Table VI, we see that frequent buying begins in the age group 25–34 years. These are often two person families or families with small children just beginning to accumulate a stock of durables. In Table VII, the cross classification of expenditures by size of the income unit shows clearly a large jump in frequency of purchases and in average amount spent between single- and multi-person income units. There is some increase in spending as the size goes above two persons—usually families with children—but the most striking difference is that between the single-and multi-person units. This is essentially a distinction by marital status.

The peculiar nature of the relationship between durable expenditures and income unit size leads us to doubt the significance or validity of the multiple regression result that expenditures are negatively correlated with size after income and asset effects are taken into acount (p. 394 above). Income and size are positively correlated; therefore part of the relationship in Table VII is a mere masking of the dominant income effect, but apart from the income effect, there is probably some effect due to marital status (*i.e.*, the distinction between single- and multi-person units).

In the case of saving, as opposed to purchases of durables, we may be more justified in accepting the negative *net* correlation with size. The simple correlation between saving and size is positive, with a growth in saving as we pass from single- to multi-person units, but also with a continued growth among multi-person units.[1] The change from positive to negative correlation,

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[1] See L. R. Klein, BULLETIN, Vol. 17, No. 2, May 1955, p. 184.

TABLE VII

Expenditures on Durable Goods by Number of Persons in the Income Unit
Savings Surveys, 1953 and 1954
(percentages of income units)

Expenditures on items costing £25 or more, 1952–53 (£)	*Number of persons in the income unit* 1	2	3	4	5	6 or more
Nil	89.6	73.5	70.6	65.1	70.0	68.9
Some expenditure	10.4	26.5	29.4	34.9	30.0	31.1
	100	100	100	100	100	100
Mean all units (£)	*10*	*33*	*25*	*32*	*26*	*25*
Mean with expenditure (£)	*89*	*125*	*86*	*91*	*85*	*82*
Expenditures on items costing £10 or more, 1953–54 (£)						
Nil	80.8	55.3	47.5	43.0	38.2	42.0
1—49	12.8	26.5	28.1	28.6	36.6	33.5
50—99	5.1	11.1	14.4	16.7	9.0	15.6
100—199	0.7	4.5	8.0	8.1	12.2	6.0
200 and over	0.7	2.6	1.9	2.7	2.1	2.8
N.A.	—	—	0.1	1.0	1.8	—
	100	100	100	100	100	100
Mean all units (£)	*11*	*29*	*37*	*38*	*38*	*44*
Mean with expenditure (£)	*58*	*65*	*71*	*67*	*62*	*76*

as we change from gross to net correlation measures, seems justified and appears similarly in the corresponding American data.[1] Contractual saving should not change sign as one moves from gross to net correlation, because the need for particular types of family saving commitments grows with size, although the ability to save in total does not. Thus within the concept of saving usually employed in the Surveys, a given variable may influence components of saving differently. This phenomenon extends to the distinction between durable expenditures and saving within the broader concept of saving. We do not, however, come to a similar conclusion with respect to age and housing status. Middle age groups and home owners are relatively high in both the saving and durable expenditures scales. We note one exception, however, since those who rent furnished are not essentially different in their saving distributions from those who rent unfurnished, whereas they appear in Table V to spend at different rates on durables.

Region and town size

Geographical location may have some effect on durable goods expenditures, but apart from income differences we have few strong *a priori* reasons for expecting any definite configuration of expenditures by region of the country or town size. There is no great year-to-year stability in the pattern of expenditures by town size. In Table VIII, we find mean expenditures varying inversely with degree of urbanization in 1952–53, but only very imperfectly so in 1953–54. Mean net income does not vary with urbanization in the same way as do expenditures; therefore we cannot explain the latter by means of the former exclusively. The large regional variations of expenditures tabulated for 1952–53 show higher outlays in the more prosperous than in the less prosperous regions, but the percentage variations in outlays do not match the percentage variations in net income.

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[1] *Contributions of Survey Methods to Economics*, ed. by L. R. Klein (New York : Columbia University Press), 1954.

TABLE VIII

Mean Expenditures on Durable Goods by Region and Town Size
Savings Surveys, 1953 and 1954

Town size	*1952–53* Expenditures	*1952–53* Net income	*1953–54* Expenditures	*1953–54* Net income
	£	£	£	£
Conurbations	20	402	26	457
Other urban	23	384	22	407
Rural	27	390	29	415
Region				
Scotland	19	374	—	—
North of England...	19	377	—	—
Midlands and Wales	25	383	—	—
South and East England ...	24	412	—	—

Comparisons with the 1952 *survey*

As the main features of the basic consumer decision patterns become apparent in repeated Surveys, we are able to build up some confidence in the results obtained. Lydall[1] has published a number of tabulations from the 1952 Survey on purchases of consumer durable goods. The expenditure-income relation is essentially similar in all three Surveys, allowing for the changed definition in 1954. When classified by net instead of gross income there is somewhat of a drop in mean outlays from the class '£1,500–1,999' to the class '£2,000 and over' in 1952.[2] This drop appears in the gross income classification for 1953 but not in the net income classification for 1954. The number of cases in these extreme income classes is small; hence we should expect a fair amount of sampling variability. Nevertheless, with some variables, e.g. total savings, we have such definite tendencies among these income groups that a change from monotonic growth is not likely to occur. There are sufficient people in these highest income classes who are so well provided with durables already[3] that they may not purchase a very great quantity in any particular year. In general, we would expect large inventories of consumer durables to discourage further expenditures on durables and, in particular, the possession of specific durables to discourage expenditures on those goods. This is particularly characteristic of a population of owners who tend to retain goods throughout their serviceable lives. The relationship between stocks and purchases is by no means apparent. We may outline, without the benefit of statistical information, various plausible modes of behaviour. (*a*) Consumers may evidence saturation influences and not buy when they already own substantial inventories of assets. (*b*) Consumers may be induced to raise their aspirations as they acquire and appreciate new durable assets. Part of this may be ascribed to emulation. (*c*) With active trade-in or second-hand markets, consumers who already own particular durables may be the most likely purchasers of new durables. Much depends on tastes and environment, but on the basis of the Survey tabulations we would not classify British consumers as outstanding examples of those behaving according to patterns (*b*) and (*c*).

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[1] H. F. Lydall, BULLETIN, Vol. 15, Nos. 10–11, Oct.–Nov. 1953, esp. pp. 377–79. See also H. F. Lydall, *British Incomes and Saving* (Oxford : Basil Blackwell) 1955.

[2] This point cannot be seen from Lydall's tables, in which all income units over £1,500 per annum are grouped into a single class.

[3] See Table XIV below.

In 1952, as in the two later Surveys, the age class 25–34 was the age group with the most frequent rates of purchase. Mean outlays by age classes were more variable, but there is a rough tendency for purchasers in the middle age groups (25–54 years) to spend the largest amounts.

The higher buying rates among married than among single-person units is evident in the 1952 tables, as is a further increase among income units with 3 or more persons. Similarly, in the case of housing status, we find home owners in the 1952 Survey buying more often than other groups and secondary income units buying less frequently than any other group in this classification. There is not, however, any indication of more frequent buying among those renting unfurnished than among those renting furnished.[1]

Some unpublished tabulations from the 1952 Survey suggest that the relationships between durable expenditures and liquid assets and windfall receipts respectively were similar in 1952 to those found in the subsequent Surveys. Those units with liquid assets purchased more often than those without. Large purchases (£200 and over) became frequent at asset levels above 30 per cent of income and much more prevalent at asset levels above 100 per cent of income. Frequencies and amounts of purchases were higher among those with windfalls than among those without, but the gradient of this relationship is not as great as in 1953.

Expenditures on Home Decorations and Repairs

Housing maintenance outlays are of an order of magnitude comparable with expenditures on durables.[2] Our brief analysis of these data will be confined to the 1953 Survey, from which more tabulations on this particular variable have been made, but the computations are much less comprehensive than for expenditures on durables. Information on this type of expenditure was not collected in the 1952 Survey.

Housing status

Decorations and repairs are obviously related, almost directly, to home ownership. In the 1953 Survey questions about these items were asked only of home owners. The expenditure distribution among owners is given in

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[1] This result cannot be seen from Lydall's tables, which pool all tenants together.

[2] Outlays on decorations and repairs are distinguished in the questionnaire from structural alterations and additions. The latter are treated as capital outlays, while decorations and repairs are considered to be current expenditures.

TABLE IX

Expenditures on Decorations and Repairs by Home Ownership and House Value
Savings Survey, 1953
(percentages of income units)

Expenditures on decorations and repairs, 1952–53 (£)	*Home ownership*		*House value (£)*								*All income units*
	out-right	*mort-gage*	*nil & under 100*	*100–999*	*1000–1999*	*2000–2999*	*3000–3999*	*4000–4999*	*5000 & over*	*N.A.*	
Nil	33.9	24.2	98.8	39.8	27.0	25.2	22.9	20.4	15.9	24.2	84.0
1—49	48.6	64.3	1.0	56.6	54.3	63.0	41.1	53.1	29.6	62.7	12.6
50—99	9.6	7.4	0.1	2.0	14.7	7.7	13.4	10.2	18.3	0.9	2.0
100—199	5.8	3.4	0.1	1.7	4.0	2.7	14.3	10.2	20.5	12.1	1.1
200 and over	2.4	0.5	—	—	—	1.4	8.1	6.1	15.9	—	0.3
	100	100	100	100	100	100	100	100	100	100	100
Mean all units (£)	*29*	*21*	—	*12*	*21*	*24*	*63*	*46*	*102*	*25*	*6*
Mean with expenditure (£)...	*43*	*28*	*31*	*20*	*29*	*32*	*82*	*58*	*121*	*33*	*36*

Table IX. In this table, we can also see the close link between amount of expenditure and estimated house value.

TABLE X

Expenditures on Decorations and Repairs by Income
Savings Survey, 1953
(percentages of income units)

Expenditures on decorations and repairs, 1952–53 (£)	*Gross income 1952–53 (£)* 0–199	200–399	400–599	600–799	800–1499	1500 & over
Nil	91.9	87.8	86.2	72.1	56.0	34.0
1–49	7.1	10.1	11.2	23.0	33.4	25.5
50—99	0.6	1.8	1.3	3.4	5.5	18.0
100—199	0.7	1.0	1.2	1.2	4.8	13.2
200 and over	—	0.2	0.3	0.3	0.5	9.4
	100	100	100	100	100	100
Mean all units (£)	*2*	*3*	*5*	*9*	*18*	*66*
Mean with expenditures (£)	*27*	*27*	*34*	*30*	*40*	*101*

Income

Apart from home ownership and house value, an obvious factor to be considered is income level. In Table X, we see a strong positive correlation between income and outlays on decorations and repairs. Class by class, these outlays are smaller than those for durables (see Table I above).

Age

The relation between mean outlays on decorations and repairs and the age of the income unit head undoubtedly reflects the relation between property ownership and age as well as the income-age correlation. We find the usual pattern—first a rise to a peak in a middle age class, in this case 45–54 years, and then a decline. Expenditures are negligible in the youngest age group, 18–24 years, because of the rarity of home ownership among these income units.

TABLE XI

Mean Expenditures on Decorations and Repairs by Age of Income Unit Head
Savings Survey, 1953

Age class	*Mean expenditure (£)*	*Mean gross income (£)*	*Percentage owning homes*
18—24	—	269	0.7
25—34	1	482	11.7
35—44	8	574	23.6
45—54	11	560	27.6
55—64	8	409	29.4
65 and over	5	240	26.9

EXPENDITURES ON EDUCATION

In the 1953 Survey, but in neither of the other two Surveys, respondents were asked :

‘ Have you any children (including those away from home) receiving full-time education ? If yes, (1) How many ? (2) Is their education free, or do you yourself pay anything for fees and boarding (away from home) expenses? If yes, how much have you paid since this time last year ? '

Expenses covered by scholarships and grants were excluded. Tabulations of the replies to this series of questions have general sociological interest as well as significance for the study of spending behaviour. In summary, we find a small fraction (about 2.4 per cent) of income units in the entire sample spending something on the education of their children. Among income units with 3 or more persons, mainly families with children, the frequency rises to 5 or 6 per cent. As expected, there is a strong income correlation. In the lowest groups, practically none of the income units spends anything on education of children, and, as can be seen by the last column in Table XII, some of these groups show a high frequency of dependent children. In the uppermost groups, the frequency of expenditure becomes as high as 40 per cent. Above the £1,000 per annum level, a significant number show expenditures as large as £200. Occupationally, the two groupings with the highest incomes, self-employed and managerial, professional and technical workers, most frequently make educational outlays. Among other groups, the numbers with outlays are almost negligible. Interestingly, the managerial and technical occupations show a higher frequency of outlay than do the self-employed even though the former do not have dependent children as frequently as do the latter. A number of these distributions are set out together in Table XII.

OWNERSHIP OF CONSUMER DURABLE GOODS

In the 1952 and 1953 Surveys, consumers were asked about the ownership of selected durable goods (motor-cars, motor-cycles, television sets, refrigerators, and washing machines). In the 1954 Survey, questions were asked about cars and television sets only. The results from the 1952 Survey have already been set out in an article by R. F. F. Dawson.[1] In this section, we shall be concerned with the time changes in ownership and the relationship of ownership to expenditure behaviour.

For motor-cars, motor-cycles and television sets, we can check Survey estimates of ownership rates with external statistics provided by licensing authorities. These checks have been applied to both the 1952 and 1953 samples with a verdict of reasonably close correspondence between Survey and independent outside data.[2] In fact, in response to relatively simple 'yes-no' questions of the ownership variety, Survey methods often reach their peak in reliability.

Housing status

As mentioned previously in connexion with expenditures on durable goods, the use of durables extends beyond the income unit and is probably more usefully analysed on a household rather than an income unit basis. We can get an impression of the degree of group use on a wider basis than

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[1] BULLETIN, Vol. 15, No. 5, May 1953, pp. 177–91.

[2] *Ibid* and BULLETIN, Vol. 17, No. 1, Feb., 1955, pp. 121–22.

TABLE XII. *Expenditures on Education by Various Classifications.*
Savings Survey, 1953
(percentages of income units)

	Expenditures, 1952–53 (£)					*Total*	*Per cent with dependent children*
	0	*1–49*	*50–99*	*100–199*	*200 and over*		
Number of persons in income unit:							
One	99.7	0.2	—	—	—	100	—
Two	98.7	0.8	0.6	0.1	0.1	100	—
Three	95.1	2.9	1.0	0.6	0.6	100	—
Four	94.0	3.1	1.0	1.2	0.5	100	—
Five	94.8	0.8	1.4	1.3	1.8	100	—
Six and over	95.8	2.2	—	—	2.0	100	—
Gross income (£):							
0—99	98.4	1.7	—	—	—	100	1.6
100—199...	99.9	0.1	—	—	—	100	3.6
200—299...	100.0	—	—	—	—	100	13.4
300—399...	98.7	0.4	0.8	—	—	100	37.0
400—499...	98.9	1.1	—	—	—	100	55.9
500—599...	98.7	1.3	—	—	—	100	64.3
600—699...	97.5	2.6	—	—	—	100	62.8
700—799...	93.0	3.1	3.1	0.5	0.5	100	61.7
800—999...	87·6	6.6	3.0	2.6	0.4	100	51.6
1000—1499	80.7	5.9	1.4	5.6	6.6	100	54.4
1500—1999	82.1	5.2	5.2	2.6	5.1	100	50 0
2000 and over	59.7	3·0	9.0	9.0	19.4	100	56.0
Occupation:							
Self-employed	91.1	3.7	1.8	0.6	2.8	100	53.4
Managers and technical	84.8	6.5	2.5	3.7	2.6	100	45.5
Clerical and sales	99.1	0.7	—	0.1	0.1	100	31.7
Skilled manual	99.1	0.7	—	—	—	100	50.1
Unskilled manual	98.6	0.9	0.6	—	—	100	42.6
Retired and unoccupied	99.0	0.5	0.3	0.1	0.2	100	8.3
Region:							
Scotland	98.3	0.6	0.7	0.1	0.3	100	—
North of England	97.7	1.3	0.7	0.1	0.3	100	—
Midland and Wales	98.0	0.9	0.5	0.5	0.3	100	—
South and East England	97.1	1.6	0.2	0.5	0.5	100	—
All income units	97.6	1.3	0.4	0.3	0.4	100	—

that provided by the income unit concept in first looking at ownership rates by housing status, a classification which distinguishes between primary and secondary income units.

TABLE XIII

Ownership of Selected Durable Goods by Housing Status
Savings Survey, 1953
(percentages of income units)

Housing status	*Percentage owning* Motor car	Motor cycle	Television set	Refrigerator	Washing machine
Owns outright	24.9	2.5	20.0	10.0	18.2
Owns, mortgage	17.1	6.2	25.1	15.2	17.2
Rents, council house	7.4	2.3	13.1	3.1	7.6
Rents, other unfurnished ...	5.6	2.6	11.4	2.1	6.0
Rents, furnished	14.4	6.2	7.2	5.3	2.9
Rent free	10.8	0.8	7.6	4.2	7.2
All primaries	10.6	3.0	14.5	5.2	9.5
All secondaries	4.8	7.0	4.5	0.7	1.2
All income units	9.3	3.9	12.2	4.2	7.6

Secondary income units rarely own refrigerators or washing machines; therefore the ownership rates among primary units given in Table XIII provide good indicators of ownership among households. The other three ownership rates on a household basis probably lie between the indicated rates for primaries (10.6, 3.0, and 14.5) and the maximum possible rates approximated under the assumptions that there is not more than one secondary per household and that primaries do not own when secondaries own (12, 5, and 16). Thus household tabulations would increase the primary ownership rates by one or two percentage points, at most.

Ownership by housing status has other interesting characteristics besides throwing light on household ownership. Home owners are more outstanding in their frequency of durable goods ownership than in the case of current purchases (see Table V). In current purchases, rates were found to be lower among those renting furnished than among those renting unfurnished, but ownership rates are not inordinately lower among the former than among the latter. Council tenants seem to have the highest ownership rate of washing machines among non-home owners, but they also have the largest income units of all housing groups. Council tenants also own television sets more frequently than do other tenants. Those renting furnished accommodation seem to be attracted towards car ownership, an asset weakly tied to the housing situation. The frequency of motor-cycle ownership, though high among secondaries, would be even higher if the large number of elderly secondaries were excluded.

In the bottom row of Table XIII, we find rates of ownership for all income units combined. Compared with the figures published by Dawson, we find a higher percentage of the population owning each of the items except washing machines.[1] Sampling errors of the percentages owning a car and a television set have been calculated by Lydall from the 1952 Survey.[2] Using these sampling errors as typical values, we can say that the difference in television ownership between the two Surveys is clearly significant and that motor-car ownership is near the borderline of significant upward change. The other changes are not statistically significant.

Licences for television sets increased by about 50 per cent from April, 1952, to April, 1953. The percentage of income units with television sets increased by about 70 per cent between the two Survey dates. For motor-cars, licences increased by 10 per cent from May, 1952, to May, 1953, while the Survey rates grew by about 13 per cent over a similar period.

Income

Just as income is obviously one of the dominant economic variables influencing purchase decisions, it is also one of the dominant variables associated with ownership of durable assets. In Table XIV, in addition to tabulating ownership by income class, we also have information on whether the item was purchased in the past 12 months (preceding interview date), thus giving some indirect insight into the relation between stocks and expenditures.

Not only did the overall ownership rates of cars and television sets show the greatest increases from 1952 to 1953, but also they were the items purchased most frequently (among our selected durables) in most income classes above the mean. As Dawson noted earlier in his analysis of the 1952 sample, car and refrigerator ownership showed the highest income gradient, but television purchase is rapidly penetrating high income classes and raising rates there.[2] In the lower income classes, television ownership, as expected, is relatively high. Washing machines and motor-cars together are next in frequency. Motor-cycle ownership is also relatively high in the lowest classes, but it ceases to keep pace with other durables after income levels of £500. In all income classes up to about £1,500, refrigerator ownership is definitely low, but after that point refrigerators, together with motor-cars, are frequently held. Television loses its position of predominance at the £1,000 level and there, together with washing machines, remains low compared with motor cars and refrigerators.

Dawson's tabulations from the 1952 Survey portray a similar array of ownership rates by income class. We would not expect asset ownership to change radically in the short space of one year. Yet we do find, in comparison with his figures, a general raising of the relative positions of car and television ownership by income class. We note especially the increase in television ownership in income classes above the mean (£434).

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[1] Comparison with figures rounded to tenths of a percentage point.

[2] BULLETIN, Vol. 16, Nos. 7–8, July–August, 1954, p. 241.

[3] During the past three years, there has been a general upward shift of the income distribution, due partly to price inflation and partly to continued prosperity. The movement of people into higher income brackets may account for some of the growth in television ownership rates there.

TABLE XIV

Ownership and Recency of Purchase of Selected Durable Goods by Income

Savings Survey, 1953

(percentages of income units)

Gross income 1952–53 (£)	*Motor car*		*Motor cycle*		*Television set*		*Refrigerator*		*Washing machine*	
	Owning	*Purchased last year*[1]	*Owning*	*Purchased last year*	*Owning*	*Purchased last year*	*Owning*	*Purchased last year*	*Owning*	*Purchased last year*
0—99	1.4	1.4	—	—	—	—	1.6	—	1.9	1.4
100—199	0.3	0.1	0.9	0.9	1.6	0.9	0.7	—	3.5	1.4
200—299	3.3	0.2	4.0	2.2	3.4	1.4	0.8	—	1.5	0.2
300—399	5.1	0.5	4.2	1.5	7.1	1.9	2.7	0.5	2.5	0.5
400—499	7.4	3.1	7.2	3.4	15.3	7.2	2.9	1.2	6.3	1.0
500—599	10.2	2.0	2.9	1.3	19.2	5.7	2.8	0.7	12.5	1.4
600—699	16.8	6.6	8.0	2.9	25.1	12.5	7.7	1.9	14.4	3.5
700—799	28.9	10.6	2.6	2.6	30.9	18.8	9.6	—	19.7	3.5
800—999	30.2	5.9	4.9	0.4	28.0	9.5	13.8	0.3	20.3	7.5
1000—1499	51.5	18.7	0.7	0.7	42.9	16.7	21.3	1.3	31.8	6.9
1500—1999	60.3	24.4	—	—	28.2	15.4	43.6	10.3	25.7	2.6
2000 & over	75.4	**16.4**	6.0	—	46.3	17.9	61.2	3.0	50.0	12.7

[1] In income classes 1000–1499 and 2000 and over, 0.7 per cent and 3.0 per cent of income units bought the unit's second car during the past year.

A separate question of importance, which can be partially analysed from the data in Table XIV, is the relationship between ownership and purchase. We might put the matter this way. On the whole, we expect a positive correlation between expenditures and income, possibly even a relationship of proportionality. Yet we find evidence, *particularly* in the 1953 Survey, of a decline in expenditures as we move from the penultimate to the ultimate income class in our groupings (See Table I). Another significant variable which may be at work in producing this result is asset ownership. We see in Table XIV that the two assets held most frequently in the top income class – motor-cars and refrigerators—are also the two assets for which frequency of purchase during the year preceding the interview falls in comparison with the penultimate income class. The figures for refrigerator ownership especially indicate a tendency to make do with assets already owned provided they are functioning well.

For self-employed income units purchases of motor-cars are not included in durable outlays if they are charged to business costs even though they are used partly for personal purposes. On the other hand, ownership of passenger cars is recorded as a personal asset whether charged to business or personal costs. These editing practices may affect the relationship between ownership and expenditures on durables in the top income classes.

Age

Except for the peculiar distribution of motor-cycle ownership, ownership of each of the selected durables exhibits the same general sort of relationship with age. The very young and very old income units infrequently have durable assets. The particular age group having the highest ownership rate in the sample varies, but the same nonlinear pattern emerges in each case. This result is related to that emerging from the tabulations by housing status, according to which we found that secondary income units owned durables, other than motor-cycles, less frequently than did other housing groups. The age distribution of ownership is given in Table XV.

TABLE XV

Ownership of Selected Durable Goods by Age of Income Unit Head
Savings Survey, 1953
(percentages of income units)

	Percentage owning				
Age	*Motor car*	*Motor cycle*	*Television set*	*Refriger-ator*	*Washing machine*
18—24	2.3	5.5	2.3	—	—
25—34	6.2	9.2	12.9	3.1	9.9
35—44	14.3	4.2	20.7	7.1	10.1
45—54	15.1	2.8	15.7	6.3	9.6
55—64	12.0	1.7	11.0	4.6	7.5
65 and over	3.7	0.4	6.0	2.5	5.4

The relative positions of income units with very young and very old heads are worth noting in these tabulations. The unit headed by a person under 25 years of age rarely own a refrigerator or washing machine. In many cases, these units have not established an independent household and have no separate need for these items, but they do own, to some extent, the other durables. The drop in frequency of ownership among elderly people is greatest for motor-cars and motor-cycles, durables requiring physical skill in operation. Television is a comfort to many old people, and they own this asset not infrequently.

Size of income unit

Income unit size gives an added dimension to family structure which is, as noted earlier, inter-connected with age and housing status; but the number of persons in the income unit gives some degree of added insight into the pattern of asset ownership.

TABLE XVI

Ownership of Selected Durable Goods by Number of Persons in the Income Unit
Savings Survey, 1953
(percentages of income units)

Number of persons in income unit	*Percentage owning:* *Motor car*	*Motor cycle*	*Television set*	*Refrigerator*	*Washing machine*
One	3.8	3.7	3.4	1.5	2.5
Two	14.3	3.0	16.0	5.1	8.7
Three	11.3	5.8	19.1	6.0	11.3
Four	13.3	4.4	19.4	7.5	11.8
Five	8.3	5.3	16.0	7.5	13.8
Six or more	5.4	0.4	7.8	1.2	11.6

All the assets listed except motor-cycles are family oriented; that is to say, ownership rates jump appreciably as we move from single persons to multi-person income units. But ownership of washing machines, unlike that of other durable goods does not fall drastically as the size of the income unit gets quite large—six or more persons—presumably for fairly obvious reasons. The very high rates of television ownership for moderate size income units is noteworthy.

Occupation

Although we attribute many of the observed occupational differences in the Savings Surveys to differences in income or wealth position, there may be some social factors explaining the differences in patterns of ownership between occupational groups. On a purely descriptive basis, we find it interesting to see ' who owns what '.

Roughly speaking, the high-income occupational groups own more frequently than the low-income groups. Motor-cycle ownership is again an obvious exception. But there are interesting differences among the other goods. Ownership rates of television sets fall less between high-income groupings (self-employed, managers and technical) and low-income groupings (others) than do rates for cars or refrigerators. Washing machine rates lie between these extremes.

TABLE XVII

Ownership of Selected Durable Goods by Occupation of Income Unit Head
Savings Survey, 1953
(percentages of income units)

Occupation	*Percentage owning:* Motor car	Motor cycle	Television set	Refrigerator	Washing machine
Self-employed	48.3	4.3	31.6	27.0	24.4
Managers and technical ...	36.8	2.1	28.0	16.2	21.6
Clerical and sales...	7.8	4.1	10.3	2.4	5.9
Skilled, manual	6.9	7.3	17.3	2.3	6.9
Unskilled, manual	2.7	2.3	4.1	1.0	6.2
Retired and unoccupied ...	2.3	0.3	3.0	2.5	3.3

Region

Like the previous grouping by occupations, regional groupings are of interest in describing the pattern of ownership. We expect to find a high degree of ownership in high income regions and a low degree in low income regions. South and East England is the region with the largest mean net income of our four regions and is also the region with the highest ownership rate for each durable except washing machines. The ordering of ownership frequencies varies for the other three regions. Infrequent television ownership in Scotland is understandable given the length of time facilities have been available. Many of the other regional differences are small and could be attributable to sampling errors.

The high figure for the North of England in the ownership of washing machines seems to be exceptional. Dawson commented on a similarly high figure for 1952 by pointing out the well known dirtiness of Northern towns. We might add that the mean number of persons per income unit is relatively high in Scotland and the North of England and relatively low in the other two regions, and in Table XVI we found a significant direct correlation between size and washing machine ownership.

TABLE XVIII

Ownership of Selected Durable Goods by Region
Savings Survey, 1953
(percentages of income units)

Region	*Percentage owning:* Motor car	Motor cycle	Television set	Refrigerator	Washing machine
Scotland	8.3	3.0	4.0	3.2	9.7
North of England	7.0	3.8	9.8	2.6	10.8
Midlands and Wales	8.8	2.6	10.7	3.4	7.8
South and East England ...	11.4	5.0	17.1	6.1	4.9

Further comparisons with the 1952 *survey*

None of the selected durables considered here is owned by more than about 12 per cent of the population; therefore in discussing ownership rates we are dealing with figures having more than the usual degree of uncertainty. By comparing the 1953 findings with those of 1952 we may be able to gain some confidence in our tabulations since some items are known to have increased during the intervening year and some are known to have remained fairly steady. In addition, except for television ownership, we should not expect our main distributions to become completely upset in the course of one year.

The extreme age groups do not appear to be greatly different in the 1952 and 1953 distributions. Most of the increase in ownership rates of cars and television sets was centred on the middle age groups. This is to be expected. Television ownership may have increased somewhat in the top age class.

In the case of income unit size, we find the main increase in television ownership distributed over the multi-person units. The change in car ownership varies from one size class to another, and the fluctuations cannot easily be distinguished from sampling variability. The generally low ownership rates, for all durables except motor-cycles, among single person units is found in the 1952 as well as the 1953 distributions.

In the occupational classifications, self-employed register the greatest changes (increments) in ownership rates for everything except motor-cycles. In the managerial class, the only striking change is the increase in television ownership. Skilled workers show a fairly definite growth in their television ownership, but most of the changes in ownership in other occupational groups are so small that they could be due to sampling error.